U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB-279 355

Automobile Exhaust Emission Surveillance - Analysis of the FY 1975 Program

Environmental Protection Agency, Ann Arbor, Mich.

Dec 77

PB 279 355

EPA-460/3-77-022
December 1977

AUTOMOBILE EXHAUST EMISSION SURVEILLANCE —ANALYSIS OF THE FY 1975 PROGRAM

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Mobile Source Air Pollution Control
Emission Control Technology Division
Ann Arbor, Michigan 48105

ATTENTION

AS NOTED IN THE NTIS ANNOUNCEMENT,
PORTIONS OF THIS REPORT ARE NOT LEGIBLE.
HOWEVER, IT IS THE BEST REPRODUCTION
AVAILABLE FROM THE COPY SENT TO NTIS.

EPA-460/3-77-022

AUTOMOBILE EXHAUST EMISSION SURVEILLANCE —ANALYSIS OF THE FY 1975 PROGRAM

by

James A. Rutherford

Office of Mobile Source Air Pollution Control
Emission Control Technology Division
Ann Arbor, Michigan 48105

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Mobile Source Air Pollution Control
Emmission Control Technology Division
Ann Arbor, Michigan 48105

December 1977

This report is issued by the Environmental Protection Agency to report technical data of interest to a limited number of readers. Copies are available free of charge to Federal employees, current contractors and grantees, and nonprofit organizations – in limited quantities – from the Library Services Office (MD-35), Research Triangle Park, North Carolina 27711; or, for a fee, from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

This report was furnished to the Environmental Protection Agency by Office of Mobile Source Air Pollution Control, Emission Control Technology Division, Ann Arbor, Michigan 48105. The contents of this report are reproduced herein as received from Office of Mobile Source Air Pollution Control. The opinions, findings, and conclusions expressed are those of the author and not necessarily those of the Environmental Protection Agency. Mention of company or product names is not to be considered as an endorsement by the Environmental Protection Agency.

Publication No. EPA-460/3-77-022

TABLE OF CONTENTS

SECTION	TITLE	PAGE NO.
1.	Summary and Conclusions	1
	1.1 Summary	1
	1.2 Findings	3
2.	Emission Factor Program - Background and Design	6
3.	Statistical Analysis	11
	3.1 Emission Data and Results	12
	3.2 Discussion	13
	3.2.1 City Effects	13
	3.2.2 Performance in First Year of Operation	14
	3.2.3 Degradation Effects	15
	3.2.4 Fuel Economy	16
	3.2.5 Highway Fuel Economy Tests	17
	3.2.6 Manufacturer Effects	17
	3.2.7 Ownership Characteristics	18
	3.2.8 Modal Emission Sequence	19
	3.2.9 Evaporative Emissions	19
	3.2.10 Sulfate Emissions	20
	3.2.11 Short Cycle Tests	20
References		23
Figure 1		24
Tables		
1.	Number of Vehicles Tested by Site and Model Year, EF75	25
2.	FY75 Emission Factor Program Summary Table of Emission Levels Using the 1975 FTP for 1976 Model Year Automobiles	26
3.	Mean Emissions After Approximately One Year of Operation from Emission Factor Programs - 1975 FTP	27
4.	Summary of Federal 49 State Standards and 1975 California Standards	28
5.	Percent of 1976 Model Year Vehicles Meeting Standards - 1975 FTP	29
6.	Statistical Distribution of Emission Data from EF75 Emission Factor Program by City, Year and Pollutant	30
7.	Emission Results for Chicago, 1975 FTP	32
8.	Emission Restuls for Denver, 1975 FTP	33
9.	Emission Results for Houston, 1975 FTP	34
10.	Emission Results for Los Angeles, 1975 FTP	35
11.	Emission Results for St. Louis, 1975 FTP	36

TABLE OF CONTENTS (con't)

Tables		Page No.
12.	Emission Results for Washington, 1975 FTP	37
13.	Emission Results for Phoenix, 1975 FTP	38
14.	Emission Results for All Cities Except Denver and Los Angeles, 1975, FTP	39
15.	Percent Meeting Federal Standards, Chicago	40
16.	Percent Meeting Federal Standards, Denver	41
17.	Percent Meeting Federal Standards, Houston	42
18.	Percent Meeting Federal Standards, Los Angeles	43
19.	Percent Meeting Federal Standards, St. Louis	44
20.	Percent Meeting Federal Standards, Washington	45
21.	Percent Meeting Federal Standards, Phoenix	46
22.	Percent Meeting Federal Standards, All Cities Except Denver and Los Angeles	47
23.	Percent Meeting California Standards, Los Angeles	48
24.	Comparison of Mean Emission Levels of New Vehicles in the FY71, FY72, FY73, FY74, and FY75 Emission Factor Programs	49
25.	1975 FTP Mean Emission Levels by Model Year for FY71, FY72, FY73, FY74 and FY75, Composite of All Cities Except Los Angeles and Denver	50
26.	Change in Emissions and Urban Fuel Economy for Vehicles in Both EF74 and EF75 Programs for all Cities Except Denver and Los Angeles	53
27.	Emission Results for All Cities Except Los Angeles and Denver by Model Year and Inertia Weight	54
28.	Fuel Economy Results for Chicago	55
29.	Fuel Economy Results for Denver	56
30.	Fuel Economy Results for Houston	57
31.	Fuel Economy Results for Los Angeles	58
32.	Fuel Economy Results for St. Louis	59
33.	Fuel Economy Results for Washington	60
34.	Fuel Economy Results for Phoenix	61
35.	Fuel Economy Results for All Cities but Los Angeles and Denver	62
36.	Highway Fuel Economy Test for Chicago	63
37.	Highway Fuel Economy Test for Denver	64
38.	Highway Fuel Economy Test for Houston	65

TABLE OF CONTENTS (con't)

Tables		Page No.
39.	Highway Fuel Economy Test for Los Angeles	66
40.	Highway Fuel Economy Test for St. Louis	67
41.	Highway Fuel Economy Test For Washington	68
42.	Highway Fuel Economy Test for All Cities Except Los Angeles and Denver	69
43.	Comparison of Highway Fuel Economy with 1975 FTP Fuel Economy, 1976 Model Year Passenger Cars and Light Duty Trucks	70
44.	Emission Results for All Cities Except Los Angeles and Denver, Results of 1975 FTP for 1976 Model Year Vehicles Presented by Manufacturer	71
45.	Emission Results for Denver, Results of 1975 FTP for 1976 Model Year Vehicles Presented by Manufacturer	72
46.	Emission Results for Los Angeles, Results of 1975 FTP for Model Year Vehicles Presented by Manufacturer	73
47.	Emission Results for All Cities Except Los Angeles and Denver, Results of 1975 FTP for 1975 and 1976 Model Year Light Duty Trucks Presented by Manufacturer	74
48.	Emission Results for Denver, Results of 1975 FTP for 1975 and 1976 Model Year Light Duty Trucks Presented by Manufacturer	75
49.	Emission Results for Los Angeles, Results of 1975 FTP for 1975 and 1976 Model Year Light Duty Trucks Presented by Manufacturer	76
50.	Emission Results for 1975 Model Year Vehicles by Response to Question Concerning Hydrogen Sulfide Odor	77
51.	Emission Results for 1976 Model Year Vehicles by Response to Question Concerning Hydrogen Sulfide Odor	78
52.	Acceleration/Deceleration Modes of Surveillance Driving Sequence	79
53.	Modal Emissions for Chicago 1976 Model Year Cars	80
54.	Modal Emissions for Chicago 1976 Model Year Light Duty Trucks	81
55.	Modal Emissions for Denver 1970 Model Year Cars	82
56.	Modal Emissions for Denver 1971 Model Year Cars	83
57.	Modal Emissions for Denver 1972 Model Year Cars	84
58.	Modal Emissions for Denver 1973 Model Year Cars	85
59.	Modal Emissions for Denver 1974 Model Year Cars	86
60.	Modal Emissions for Denver 1975 Model Year Cars	87
61.	Modal Emissions for Denver 1976 Model Year Cars	88
62.	Modal Emissions for Denver 1975 and 1976 Model Year Light Duty Trucks	89

TABLE OF CONTENTS (con't)

Tables		Page No.
63.	Modal Emissions for Houston 1976 Model Year Cars	90
64.	Modal Emissions for Houston 1975 and 1976 Model Year Light Duty Trucks	91
65.	Modal Emissions for Los Angeles 1970 Model Year Cars	92
66.	Modal Emissions for Los Angeles 1971 Model Year Cars	93
67.	Modal Emissions for Los Angeles 1972 Model Year Cars	94
68.	Modal Emissions for Los Angeles 1973 Model Year Cars	95
69.	Modal Emissions for Los Angeles 1974 Model Year Cars	96
70.	Modal Emissions for Los Angeles 1975 Model Year Cars	97
71.	Modal Emissions for Los Angeles 1976 Model Year Cars	98
72.	Modal Emissions for Los Angeles 1975 and 1976 Model Year Light Duty Trucks	99
74.	Modal Emissions for St. Louis 1970 Model Year Cars	100
75.	Modal Emissions for St. Louis 1971 Model Year Cars	101
76.	Modal Emissions for St. Louis 1972 Model Year Cars	102
77.	Modal Emissions for St. Louis 1973 Model Year Cars	103
78.	Modal Emissions for St. Louis 1974 Model Year Cars	104
79.	Modal Emissions for St. Louis 1975 Model Year Cars	105
80.	Modal Emissions for St. Louis 1976 Model Year Cars	106
81.	Modal Emissions for St. Louis 1975 and 1976 Model Year Light Duty Trucks	107
82.	Modal Emissions for Washington 1976 Model Year Cars	108
83.	Modal Emissions for Washington 1976 Model Year Light Duty Trucks	109
84.	Fuel Evaporative Emissions Using the Enclosure Technique, 1976 Model Year Cars in Denver and Los Angeles	110
85.	Results of Sulfate Emissions Testing, 1976 Model Year Cars	111
86.	Results of Sulfate Emissions Testing 1975 Model Year Cars	112
87.	Results of Sulfate Emissions Testing, 1975 and 1976 Model Year Light Duty Trucks	113
88.	Short Test/FTP Emission Sample Correlations for 1975 and 1976 Model Year Cars and for all Model Year Vehicles	114
89.	Contingency Analysis, Federal Short Cycle	115
90.	Contingency Analysis, New Jersey Acid and New York Short Composite	116
91.	Contingency Analysis, Clayton Key Mode	117

TABLE OF CONTENTS (con't)

Tables	Page No.
92. Contingency Analysis, Two Speed Idle	118
93. Contingency Analysis, Federal Three Mode	119
94. Contingency Analysis, Revised Federal Three Mode	120
95. Contingency Analysis, New York City Cycle	121
Appendix I	122
I-1 Emission Results for Chicago, Cold Transient	123
I-2 Emission Results for Chicago, Cold Stabilized	124
I-3 Emission Results for Chicago, Hot Transient	125
I-4 Emission Results for Denver, Cold Transient	126
I-5 Emission Results for Denver, Cold Stabilized	127
I-6 Emission Results for Denver, Hot Transient	128
I-7 Emission Results for Houston, Cold Transient	129
I-8 Emission Results for Houston, Cold Stabilized	130
I-9 Emission Results for Houston, Hot Transient	131
I-10 Emission Results for Los Angeles, Cold Transient	132
I-11 Emission Results for Los Angeles, Cold Stabilized	133
I-12 Emission Results for Los Angeles, Hot Transient	134
I-13 Emission Results for St. Louis, Cold Transient	135
I-14 Emission Results for St. Louis, Cold Stabilized	136
I-15 Emission Results for St. Louis, Hot Transient	137
I-16 Emission Results for Washington, Cold Transient	138
I-17 Emission Results for Washington, Cold Stabilized	139
I-18 Emission Results for Washington, Hot Transient	140
I-19 Emission Results for Phoenix, Cold Transient	141
I-20 Emission Results for Phoenix, Cold Stabilized	142
I-21 Emission Results for Phoenix, Hot Transient	143
I-22 Emission Results for All Cities Except Denver and Los Angeles, Cold Transient	144
I-23 Emission Results for All Cities Except Denver and Los Angeles, Cold Stabilized	145
I-24 Emission Results for All Cities Except Denver and Los Angeles, Hot Transient	146
I-25 Emission Results for All Cities Except Denver and Los Angeles by Model Year and Inertia Weight, 1972 FTP	147

TABLE OF CONTENTS (con't)

Appendix I — Page No.

I-26 Emission Results for Chicago, 1972 FTP 148

I-27 Emission Results for Denver, 1972 FTP 149

I-28 Emission Results for Houston, 1972 FTP 150

I-29 Emission Results for Los Angeles, 1972 FTP 151

I-30 Emission Results for St. Louis, 1972 FTP 152

I-31 Emission Results for Washington, 1972 FTP 153

I-32 Emission Results for Phoenix, 1972 FTP 154

I-33 Emission Results for All Cities Except Denver and Los Angeles 1972 FTP 155

I-34 Emission Results for Chicago, Idle HC and Idle CO Test Results 156

I-35 Emission Results for Denver, Idle HC and Idle CO Test Results 157

I-36 Emission Results for Houston, Idle HC and Idle CO Test Results 158

I-37 Emission Results for Los Angeles, Idle HC and Idle CO Test Results 159

I-38 Emission Results for Washington, Idle HC and Idle CO Test Results 160

I-39 Emission Results for Phoenix, Idle HC and Idle CO Test Results 161

I-40 Emission Results for All Cities Except Denver and Los Angeles (and St. Louis), Idle HC and Idle CO Test Results 162

Appendix II

1. SUMMARY AND CONCLUSIONS

Through the Office of Air and Waste Management, EPA contracts with several independent laboratories to perform dynamometer emission testing of in-use light duty vehicles. The Emission Factors Testing Program is a continuing project administered by the Emissions Control Techonolgy Division, a part of the Mobile Source Air Pollution Control (MSAPC) program located in Ann Arbor, Michigan. This report summarizes the data from the fifth year (FY 75) in the series and updates the sample to include 1976 model year vehicles as well as provides continued monitoring of previous model years. State and local agencies, Federal air pollution officials, automobile manufacturers, and concerned citizens can use this summary to estimate the impact of light duty vehicle emissions on air quality and to determine conformity of vehicles to the standards under which they were certified.

The data summarized in this report were generated from a random sample of in-use vehicles in seven cities: Chicago, Denver, Houston, Los Angeles, Phoenix, St. Louis, and Washington D.C. Exhaust emission tests were performed on each vehicle in accordance with the 1975 Federal Test Procedure (FTP), a transient driving cycle with an average speed of 19.6 mph. The 1975 FTP exhaust emission test procedure is comprised of three phases:

(1) a cold transient phase representative of vehicle start-up after a long engine-off period;

(2) a stabilized phase representative of engine operation after the normal operating temperature has been achieved; and

(3) a hot transient phase representative of vehicle operation immediately after a relatively short engine-off period.

The emission test results of the three phases of the 1975 FTP are weighted 21%, 52%, and 27%, respectively, before they are combined. The tests were conducted by two contractors and more detailed information on the FTP tests, other specific tests or test results can be found in the reports of the contractors, References (1) and (2).

When possible comparisons are made between the results of the FY75 Program and those of previous years, References (3), (4), (5), and (6). These comparisons are made on the basis of the 1975 FTP. However, FY75 summary results are also presented for the 1972 FTP to facilitate comparison if these weighting factors are preferred.

1.1 SUMMARY

The FY75 Emission Factor Program consisted of exhaust emission tests on 1966 through 1976 model year in-use vehicles and light duty trucks (LDT) under 6,000 lbs gross vehicle weight in each of seven cites. Measurements

of hydrocarbon (HC), carbon monoxide (CO), oxides of nitrogen (NOx), and carbon dioxide (CO_2) emissions were performed. The test locations were selected to represent heavily populated areas of diverse meteorological, geographical, and usage environments. The northeast sector and northern Great Plains with long winters are represented by Chicago. The Great Plains region having moderate winters is represented by St. Louis while that of a very warm, humid climate is represented by Houston. Mountainous metropolitan areas are represented by Denver. Los Angeles represents the temperate, warm western region and different standards and Washington D.C. is typical of cities on the eastern seaboard. The desert areas are represented by the inclusion of Phoenix in the group of surveyed cities.

The vehicles tested in each city were selected to be a nationally representative (random) sample of cars within a model year but the number of vehicles for each model year are not representative of the total population of in-use vehicles. A sufficient sample of 1976 model year vehicles were tested so that average emissions for each manufacturer could be used to generate composite emission levels on the basis of a weighting by manufacturers. Therefore, in using the data, comparisons must be made on a model year basis. The number of vehicles tested in each model year for each city are given in Table 1.

A summary of the FY75 Emission Factor Program results for 1976 model year vehicles is presented in Table 2. The most noteworthy differences displayed in this table indicate that emission rates in Denver and Los Angeles are significantly different from those of the other cities. Los Angeles had significantly lower HC, CO, and NOx emissions than the other cities (presumably because of stricter standards) while Denver had significantly greater HC and CO and significantly lower NOx emissions than the other cities (because of the higher elevation). For this reason, composite tables have been prepared combining all cities except Los Angeles and Denver. The composite emissions from all test cities except Los Angeles and Denver are believed to be the best single estimates representative of all the remaining sections of the country (i.e., non-California low altitude areas).

More stringent Federal standards went into effect for the 1975 model year vehicles. The influence of these standards on the emission levels can be realized by comparing the average emissions for each model year in its first year of operation. Table 3 presents such arithmetic average emissions for the composites of all cities excluding Denver and Los Angeles, as well as for Denver, and for Los Angeles. It is noteworthy that average 1975 and 1976 model year HC and CO emissions are significantly lower than those of previous years for the composite, for Denver, and for Los Angeles. Average NOx levels are not signficantly reduced from those of the 1974 model year vehicles but are significantly lower than those of pre-1974 model years.

The only statistically significant difference between 1975 and 1976 model year vehicles is the 34% decrease in mean NOx levels for Los Angeles vehicles. The HC and CO reductions occuring in 1975-76 models are probably attributable to the manufacturers conversion to catalytic converters and other improvements in emission controls but it should be noted that the average mileage for these vehicles at the time of their tests was considerably less than that of the other model years.

The Federal 49 State Standards and 1975 California Standards for emissions in grams per mile based on constant volume sampling are summarized in Table 4.

The 1975 standards are expressed in terms of the 1975 FTP while the other standards are 1972 FTP. A conversion between the 1972 FTP and the 1975 FTP depends upon vehicle mix but approximately equivalent values for the 1972-1974 model year vehicles are:

	HC	CO	NOx
1972 FTP	3.4	39	3.0
1975 FTP	3.0	34	3.1

The 1975 Federal 49 State Standards for HC and CO are considerably more stringent than those of previous years while the NOx standard has not been reduced. It is of interest to note that although average HC and CO emissions have been significantly reduced in the 1975 and 1976 models, the 1976 model year composite arithmetic average for CO is still greater than the standard. Average NOx emissions in Denver for 1976 model year vehicles are less than the standard but average HC and CO emissions exceed the standard in this city. The Los Angeles average emissions are less than the California Standards and thus, are less than the Federal 49 State Standards for all three pollutants.

In addition to the basic FTP test, highway fuel economy tests, modal emissions tests, evaporative emissions tests, sulfate emissions tests, and seven (7) short cycle tests were conducted during the FY75 Emission Factor Program. The data from these tests are also summarized in this report. Each vehicle owner also completed a questionnaire concerning usage, maintenance and repair of his vehicle. An attempt was made to identify relationships between questionnaire responses and emission rates but for most of the questions no consistent trends were identified.

1.2 FINDINGS

Results of the FY75 Emission Factor Program summarized in this report reveal that:

1. Individual vehicles of any stratification show wide dispersion in exhaust emissions. The coefficient of variation (standard deviation divided by the average) is typically greater than

50% and quite often is greater than 100%. Consequently, two groups of vehicles, e.g., populations of vehicles tested in two different cities, may show considerable overlap of their statistical distributions even though the mean emissions for the two groups are appreciably different. Generalizations with regard to make, city or other categories of interest, therefore, are often not applicable to comparison of individual vehicles or small subsets of vehicles drawn from the two categories.

2. The comparison of the average emission differences between cities indicates that emissions from Denver and Los Angeles vehicles are significantly different from those of all other cities. Average HC and CO emissions in Denver are significantly greater than those of the other cities while average NOx emissions are significantly lower. These Denver differences have been observed in past programs and have been attributed to the effect of altitude on air-fuel ratios. Los Angeles vehicles had significantly lower HC, CO, and NOx emissions than all other cities. Some individual differences between cities for particular model years were significant but such differences were not consistent for all model years. Note that the model year by city stratification has relatively small sample sizes for all model years except 1976.

3. Of the 1976 model year vehicles in Denver 15% met 49 State Emission Standards. In Los Angeles 71% of 1976 model year vehicles met California Standards. For the remaining sites 47% of 1976 model year vehicles met 49 State Standards. These percentages are significantly higher than the equivalent percentages for new vehicles in the 1974 Emission Factor Program. However, it must be noted that new vehicles in the 1974 Emission Factor Program had accumulated lower mileage on the average than new vehicles in the 1975 Emission Factor Program and this could be a confounding factor.

4. Model year 1976 vehicles in the FY75 EFP were not statistically different from 1975 model year vehicles in the FY74 EFP in terms of mean emissions with the exception that Los Angeles showed a 34% decrease in mean NOX emissions.

5. Comparison of FY71, FY72, FY73, FY74, and FY75 Emission Factor Programs indicates a general trend for HC and CO average emissions to increase with age of the vehicle.

6. There is a general trend toward increasing fuel economy for individual model year vehicles over the last three programs. This result could be a spurious result of model mix in the different programs. A result free from the model mix confounding is that fuel economy increased for vehicles which were tested in both FY74 and FY75 programs for each model year.

7. Vehicles whose owners indicated presence of hydrogen sulfide odor had significantly higher mean HC levels than other vehicles. No other consistent effect on emission levels due to ownership characteristics was detected. Relationships between fuel economy and ownership characteristics are presented in separate publications (see References 10 and 11).

8. Correlations of short cycle tests with the 75FTP are generally greater than .8. A method is presented which attempts to evaluate short cycle tests on the basis of correct identification of excess emissions.

2. EMISSION FACTOR PROGRAM BACKGROUND AND DESIGN

The Congress, through the enactment of the Clean Air Act of 1963 and amendments thereto, provided for a national air pollution program to monitor and control emissions from new motor vehicles. Administrative responsibility for the air pollution control program is vested with the U.S. Environmental Protection Agency (EPA).

The first nationwide standards for exhaust emissions, together with the testing and certification procedures, were issued in 1966 and were applicable to 1968 model year passenger vehicles and light duty trucks under 6000 lbs GVW sold within the United States. Levels for maximum allowable exhaust emissions were imposed initially on HC and CO pollutants only. Hydrocarbons were restricted to 275 parts per million concentration and carbon monoxide was restricted to 1.5 percent. These pollutants were measured using the 7-mode cold-start test procedure.

More stringent standards on a mass equivalent basis were introduced for 1970 and 1971 model year vehicles. The Federal Standards based on the 7-mode procedure, expressed in mass equivalents, were 2.2 grams/mile for HC and 23 grams/mile for CO. In 1972, a change was made to a new test procedure. This procedure involved a new sampling method, the Constant Volume Sampling Procedure (CVS), and a new driving sequence. At that time the standards were again strengthened. HC was restricted to 3.4 grams/mile and CO was restricted to 39.0 grams/mile. The numerical increase in the standards from 1971 to 1972 reflects the increased stringency of the testing procedures. In terms of the 1972 test procedure, the 1971 standards were equivalent to approximately 4.6 grams/mile for HC and 47 grams/mile for CO. The first Federal Standards applicable to oxides of nitrogen were instituted with the 1973 model year and were set at 3.0 grams/mile. For 1975 model year vehicles, the Federal Standards were again strengthened with the promulgation of tighter Federal Standards under the 1975 test procedure. The 1975 test procedure produces slightly lower numerical values thatn the 1972 test procedure. The 1973-1974 standards (3.4 gm/mi HC, 39 gm/mi CO, 3.0 gm/mi NOx) in 1975 FTP terms wouldbe 3.0 grams/mile for HC, 34 grams/mile for CO and 3.1 grams/mile for NOx.

Under the Clean Air Act, manufacturers are required to submit applications containing data gathered during both phases of a two-part test program in order to qualify for Certificates of Conformity. The first phase of testing provides data on exhaust emissions which show the performance of the control equipment after the engine has been broken in, but before substantial mileage has been accumulated. These data are known as 4000 mile emission data. The second phase of the test program provides data on the durability of the emission control system. These data are known as 50,000 mile durability data.

For 1968-1971 model year vehicles, compliance was demonstrated whenever the mean emission level from a specified sample of emission-data prototypes of each engine displacement, weighted according to projected sales volume, was at or below the applicable standard. This mean incorporates a deterioration factor determined from a sample of durability-data prototypes representative of at least 70% of the manufacturer's engine displacement/transmission options. Inherent in this method of certification is the fact that mean values for HC or CO near the levels specified in the standard may result in as many as 50% of certified or in-use vehicles being above the standard for either pollutant. (The 50% figure assumes that emissions of prototype vehicles are symmetrically distributed. In the case of lognormality, less than 50% but still an appreciable fraction of the vehicles could be above the standard).

For 1972 and subsequent model year vehicles, every vehicle tested in the certification sample must have emissions below the level of the applicable standard. The certification prototypes are tested with vehicle parameter settings, e.g. engine timing, at or near the mean of the allowable production range. Therefore, to the extent that emissions vary within the allowable range of parameter settings, some percentage of production vehicles might be expected to emit pollutants above the standard.

The overall purpose of the Emission Factor Program is to characterize, quantify, and reduce the air pollution caused by mobile sources, including automobiles, motorcycles, trucks and buses. The program requires a large base of accurate data on in-use vehicles from which to make valid determinations, predictions and decisions. Mobile source emission factors are used in making important decisions at various levels of government; they are used by the Office of Mobile Source Air Pollution Control, Mobile Source Enforcement Division, and the Office of Air Quality Planning and Standards, the Department of Transportation, EPA regional offices, and the Federal Highway Administration. They are also used by city governments, air pollution councils, consulting organizations, and private citizens. Among other things they are used to file Environmental Impact Statements, make air pollution inventory calculations, evaluate inspection and maintenance programs and to assess the compliance of in-use vehicles with applicable standards.

Since early in 1968 when the Emission Factor Programs were conducted by the Certification and Surveillance Division, a continuing succession of programs have been conducted to measure the emissions from in-use automobiles, trucks, and buses. Each of these programs has kept pace with the continually changing test procedures in order to provide the EPA with timely information on the effectiveness of increasingly stringent standards and to assess the deterioration of vehicles with age and use.

Since the first of these programs which tested vehicles in two cities, the program has now expanded to seven test cities of various topographical and climatic conditions. The original program was conducted in Kansas

City and Houston. Testing is now conducted in Washington, D.C., Chicago, St. Louis, Houston, Denver, Phoenix, and Los Angeles. In addition testing has been performed in San Antonio, Newark, and Detroit. Because these programs are conducted on a continuing basis, a constant assessment can be made of the mobile source contribution to the national air pollution problem as well as the effectiveness of various mobile source compliance strategies.

The FY75 program involved the testing of approximately 2200 vehicles in seven cities. Vehicles from the 1966 through the 1976 model year have been tested. The selection of vehicles was based on sales weighting for make and model and vehicle miles traveled weighting for model year, assuming that the newer model year vehicles are driven more than the older vehicles and that the vehicles have a useful life of 10 years. The primary test performed on each vehicle was a modified version of the 1975 Federal Test Procedure. In order to save costs some shortcuts have been used in the conduct of these tests as compared to the certification tests. It is felt that the impact of these shortcuts on the actual emission values is minimal. One of the major differences is the preconditioning. In emission factor work, preconditioning consists of a 10 minute drive on city streets near each laboratory as compared to certification's one hour drive over a prescribed road route. A second major difference is the certification procedure of running an evaporative test on each vehicle while in emission factor work, this procedure is not performed except on a limited number of vehicles. There are other minor differences which will not be discussed at this time.

In addition to the basic 1975 FTP test on each vehicle, the following tests were administered on selected subsets of the study sample: Highway Fuel Economy Test, Federal Short Cycle Test, New York Short/ New Jersey Acid Composite Test, Clayton Keymode Test, Two Speed Idle Test, Federal Three Mode Test, New York City Cycle Test, Revised Federal Three Mode Test, Modal Exhaust Emission Test, Evaporative Emission Test and Sulfate Emission Test.

In Addition to all of the tests a questionnaire is filled out by each participant concerning his or her usage and maintenance of the vehicle.

The prime objective of the Emission Factor Program is to provide a valid estimate of the emissions from the population of in-use vehicles. Accordingly, considerable care has been exercised in the conduct of this continuing effort to ensure that a representative sample of vehicles is selected for testing, that the tests are conducted under identical, rigidly controlled conditions, and that all resulting data are subjected to quality inspections.

The following paragraphs describe the FY75 selection of vehicles and present a brief summary of the vehicle handling procedure. Futher details concerning the conduct of the testing can be found in the individual contractor reports, References (1) and (2) and in the report of the FY72 Emission Factor Program, Reference (4). Details of the EPA data validation process can be found in Reference (12).

The selection of the cities to be sampled in the FY75 Emission Factor Program were chosen to represent heavily populated areas of diverse geographical and climatological regions as discussed in Section 1. The selection of vehicles were not chosen to provide a random sample of vehicles within a city. Rather, the sample selected was random for each model year but the number of vehicles for each model year is not representative of the in-use vehicles for the cities. Note that with the FY75 Emission Factor Program sampling procedure, comparisons with previous programs must be made on a model year basis and cannot be made on a basis of results averaged over several model years.

Within each city and within each model year, the particular selection of the desired number of vehicles was made to provide a random sample based on national vehicle sales by vehicle make, engine size, carburetor type, and transmission type. From an automobile registration list, a sample of vehicles was selected which best fit the required vehicle population profile. The owners of the selected vehicles were then contacted and provided with inducements if their vehicles were used for testing. These included at $50 U.S. Savings Bond, the use of a loan car while their car was being tested, and a full tank of gasoline.

Upon delivery of a test vehicle to the laboratory it was inspected to insure that it could be safely run on the dynamometer. Cars which failed this inspection were rejected. Exhaust emissions were determined by the constant volume sampling technique in accordance with the 1975 Federal Test Procedure. The vehicles were tested in an as-received condition so that the resulting emission data would reflect variability in owner usage, maintenance and repair practices. The additional tests which were performed on a subset of the vehicles are described in Section 3 of this report. Upon completion of testing, engine diagnostic procedures were performed which included basic timing, point dwell and idle rpm. See References (1) and (2) for listing of individual vehicle measurements.

To be assured of receiving accurate data, an elaborate system of laboratory qualification has evolved over the years. Combined with the initial laboratory qualification are requirements for continuous verification of equipment and personnel performance. Various daily, weekly, bi-weekly, and monthly calibration checks are required. In addition, monthly on-site inspections (both announced and unannounced) are performed after testing begins. Errors discovered during these monitorings and subsequent review of the data could warrant more frequent checks at a site.

As all of the data derived from the program are backed up by hard copy evidence such as strip charts and log books, review of the contractors performance is also done on a continuous basis. This manual review process although time consuming can give the first indication of difficulties in the conduct of the program. The data also undergo a computer edit before inclusion in the data file. Assuming that the contractor also conducts a review of the data before submission to EPA, this three tiered (on-site, contractor, and EPA) review process should virtually eliminate all errors. However, experience has shown that errors can and do slip by even with this extensive review process. Improvements, based on problems encountered in each past program are incorporated in the next program. With each new program, EPA monitoring of actual testing performance has increased as has manual and computer editing.

3. STATISTICAL ANALYSIS

The primary purpose of this report is the exposition of summary results from the FY75 Emission Factor Program. The primary mode of report is in the form of sample means and standard deviations presented for various stratifications of the total population of in-use vehicles. As discussed below, emissions are generally given in terms of arithmetic and geometric means while fuel economy is given in terms of harmonic means. More extensive analysis of the data can be found in reports and memos relating to specific questions.

Theoretical and empirical arguments found in Reference (4) make a strong case for the assumption that auto exhaust emissions have lognormal frequency distributions; i.e., if the logarithms of individual emission observations are utilized, the resultant transformed sample frequency distribution appears to correspond to that of a sample from a normal (Gaussian) distribution. The lognormal distribution is completely characterized by the geometric mean and standard deviation. This is the motivation for the inclusion of geometric means and standard deviations in the tables.

If the distribution of an emission were symmetrical and fifty percent of a sample of vehicles met a standard for that emission, the mean of all the vehicles would also meet the standard. This relationship does not apply, however, with a skewed distribution as is the lognormal. If an indication of total mean emissions is desired and the vehicle population has a skewed distribution, the mean emission level of a group of vehicles must be looked at independently of the percent of these vehicles which conform to a standard. Thus, the arithmetic means are useful in assessing the impact of groups of vehicles on air quality. The geometric means are indicative of central tendency. In a lognormal distribution, the geometric mean indicates the 50th percentile point of the distribution.

A word of explanation is in order with regard to the geometric mean and standard deviation and their interpretation in an emissions context. If the geometric mean is multiplied by the geometric standard deviation, one obtains a quantity which represents approximately the 84th percentile of the distribution, in much the same way as one obtains this percentile in a normal distribution by <u>adding</u> the standard deviation to the mean. Similarly, by multiplying the geometric mean by the geometric standard deviation <u>squared</u>, one obtains approximately the 95th percentile of the distribution in much the same way as one obtains this percentile in a normal distribution by adding two standard deviations to the mean.

Upon examination by city and model year, the lognormality assumption for distributions of the emissions measured in the FY75 Emission Factor Program could not for the most part be rejected at the nominal .01 level. The results of Lilliefors' (Reference 7) adaptation of the Kolmogorov-Smirnov test against general distributional alternatives are presented in Table 6.

As noted earlier, fuel economy data are summarized in terms of harmonic mean and standard deviation of the parameter observed, miles per gallon. The average fuel economy for a group of vehicles can be defined as total miles divided by total fuel consumed. It can be shown that since all individual vehicles are driven the same distance in the tests, that average fuel economy in miles per gallon is the harmonic mean of the fuel consumed during the tests of the individual vehicles. See Reference (4) for the derivation of this equivalence and method of statistical inference regarding the fuel economy parameter.

3.1 EMISSION DATA AND RESULTS

The results of the FY75 Emission Factor Program are summaried in Tables 1 through 95, Appendix I, and Appendix II. In the event that a user would prefer other than FTP weighting factors, Appendix I contains summaries of the cold transient, cold stabilized and hot transient portions of the FTP test as well as the idle HC and CO test results for each city and for the composite of all cities excluding Denver and Los Angeles. In addition, summary tables are also included using the 1972 FTP for ease in comparing with the results of previous years. Appendix II contains a summary of the questionnaire data concerning the ownership characteristics of the vehicles.

Tables 7 through 14 present means and standard deviations of the emissions for each model year by city combination and a composite of all cities except Denver and Los Angeles. Tables 15 through 22 present the number and percent of vehicles meeting Federal 1972, 1973, 1974, and 1975 standards for each city and for the composite of all cities except Denver and Los Angeles. Similar results for Los Angeles vehicles meeting California Standards are shown in Table 23. Comparisons of FY 1974 results with previous years are contained in Tables 24 and 25. Results for vehicles included in both EF74 and EF75 Programs are presented in Table 26. The vehicle emissions and fuel economy results by model year and inertia weight for the composite of all cities except Denver and Los Angeles are presented in Table 27. Denver and Los Angeles data are not presented in this format due to the small sample sizes that result in this stratification of the data.

Tables 28 through 35 summarize the fuel ecomomy results for each model year by city combination and for a composite of all cities except Denver and Los Angeles. Tables 36 through 42 present the results of the Highway Fuel Economy Tests for each city and for the composite of all cities except Denver and Los Angeles. A comparison of Highway Fuel Economy with FTP Fuel Economy is presented in Table 43. The vehicle emission results by manufacturer are presented as a composite of all cities excluding Denver and Los Angeles and for Denver and for Los Angeles in Tables 44 through 49.

Tables 50 and 51 present emission levels for each response on the question from the questionnaire concerning the presence of hydrogen sulfide odor. The Modal Tests are presented by city and model year in Tables 52 through 83. Results from the Fuel Evaporative Emissions Tests, Sulfate Emissions Tests, and the Short Cycle Tests are presented in Tables 84 through 95.

3.2 DISCUSSION

The following paragraphs present a review of the FY75 Emission Factor Program in terms of identifying signficant trends or differences with respect to major sources of possible effects. In particular, the emission data are considered in terms of city effects, performance of vehicles in first year of operation, degradation effects, fuel economy, manufacturer effects, and the correlation of emissions with ownership characteristics. The results of the highway fuel economy, evaporative emissions, sulfate emissions, and short tests are also presented and discussed.

3.2.1 CITY EFFECTS

The cities selected for the FY75 Emission Factor Program were chosen to represent a broad spectrum of regional, geographical, and meteorological attributes. The term "city effects" is used to describe the accumulation of all possible factors in a given locality which might combine to yield emission levels which are characteristic of only that city. The emission results for the cities as compared by model year using the 1975 FTP emission levels are given in Tables 7 through 14, the percent meeting federal standards in Tables 15 through 23, and the idle HC and idle CO measurements in Tables I-34 through I-40 of Appendix I.

Further confirmation of results gleaned from earlier EF Programs is evident with respect to the relative homogeneity of non-California low altitude vehicles and the divergence of Los Angeles and Denver vehicles. For most model years, Denver shows significantly higher 75 FTP HC and CO and lower NOx. For 1975 and 1976 model years, Los Angeles shows significantly lower mean emissions for all three FTP measurements. Though for certain model years there appears to be significant differences among the remaining cities, there is no recognizable pattern of disparity among these cities for the three FTP emissions.

Consideration of failure rates leads to the same homogeneity/heterogeneity conclusions. For both the 1975 and 1976 model years separately, there is no significant difference in the 1975 49 State Standard failure rates among the five city composite while Los Angeles shows significantly lower failure rates and Denver shows significantly higher failure rates than the composite.

The probable explanations for the divergence of Los Angeles and Denver vehicles from the composite vehicles are well known. Beginning in 1975, California standards were much lower than 49 state standards and different emission control technologies were employed to meet the lower standards. Vehicles in Denver run with richer mixtures due to altitude.

Idle measurements of HC and CO lead to slightly different conclusions. Although mean idle emissions from Denver are generally higher than composite means and those from Los Angeles are generally lower than composite means, these differences are only statistically significant for Denver model year 1976 vehicles and on idle CO and for model year 1974 Los Angeles vehicles.

Idle measurements for St. Louis appeared highly paradoxical. Although no fault has yet been found it is suspected that either the test procedure was not followed correctly or that the test instruments were malfunctioning. EPA personnel are presently investigating the problem. Until the matter has been resolved it is inappropriate to present the data, and thus, idle results for St. Louis (including short tests which utilize the same instruments) will not appear in this report.

3.2.2 EMISSION PERFORMANCE IN FIRST YEAR OF OPERATION

In order to compare the model year trends of emissions for in-use vehicles while minimizing the interference of degradation effects the newest model year vehicles present in each of the Emission Factor Programs are examined for trends. Table 24 presents the sample size and arithmetic mean and standard deviation of the emissions using the 1975 FTP for each model year in its first year of operation. The data for the 1971, 1972, 1973, 1974 and 1975 new model year vehicles were obtained from reference (6). The composite means include all cities except Denver and Los Angeles.

In comparing the 1976 model year vehicles with 1975 model year vehicles, it is seen that the two have very close mean emissions relative to earlier model years. The only statistically significant difference in means for these two model years is the 34% decrease in mean NOx for Los Angeles vehicles. The average model year 1975 and average model year 1976 mileages in thousands of miles are 8.8/11.5, 13.5/10.9, and 8.1/8.7 for composite, Denver, and Los Angeles vehicles respectively.

It was noted in the FY74 Report (Reference 6) that significant reductions in HC and CO means were present for vehicles in all three site groups from 1974 to 1975 model years while only composite vehicles showed significant reduction in NOX over those model years. However, the data utilized for 1974 and 1975 model year vehicles were all taken from the FY74 EF Program and thus mean mileages for model year 1974 vehicles were about twice those for model year 1975 vehicles.

3.2.3 EMISSION DEGRADATION EFFECTS

It has been reported in previous Emission Factor Programs that as mileage of a vehicle increases so do the exhaust emissions. This effect is attributed to a combination of many factors, including aging, engine maintenance practices, and repair practices. Table 25 presents a summary of the emission and fuel economy data that were obtained for each model year in the five Emission Factor Programs conducted to date. The data were derived using the 1975 FTP and are for the composite of all cities except Los Angeles and Denver.

The addition of FY75 Program data tends to support previously noted trends although departures from monotonic trends are becoming more prevalent. For each model year, mean mileage increases with time as represented by the five programs. Average HC and CO emissions tend to increase with age although this trend is not monotonic. It should be noted that for each model year mean HC and CO emissions are higher in the last program from which data are available than in the first. NOx emissions appear to show a decreasing trend with age with about the same degree of generality although 1974 and 1975 vehicles show no significant change. All of these trends must be viewed in terms of the uncertainty in the estimates of the means as would be reflected by confidence intervals about the observed averages.

Perhaps a more meaningful and valid approach to the question of degradation is the observation of a particular group of vehicles as they accumulate in-use miles over time. The beginnings of such an approach were made possible in the FY75 Program by the inclusion of some vehicles in the sample which had been in the FY74 Program sample along with an appropriate identification crossreferencing system. Table 26 presents the data from these vehicles which were collected in the two programs. These data can be approached in two different ways. One could be interested in the deterioration of individual vehicles or in the deterioration of the group of vehicles. The former is of interest in terms of vehicle characterization while the latter is of interest in terms of air quality effects. Summary measures for the former involve the mean of the individual vehicle deteriorations while summary measures for the latter involve the deterioration of the means. As seen in Table 26, the deterioration of the means (DM in the table) results in a smoothing effect which tends to make the summary measure less erratic than the mean deterioration. An extreme example of this can be seen for model year 1970 vehicles in the table. The relatively large mean deteriorations for the three emissions and fuel economy were caused by a few vehicles with very high rates. The effect of these few vehicles is toned down in considering the deterioration of the means. It should be noted that positive deterioration for NOx occurs only for 1974 and 1975 model year vehicles. These are the only vehicles in the table for which NOx was regulated.

3.2.4 FUEL ECONOMY

In conducting the emission test for a particular vehicle, the amount of CO_2 emitted is measured in addition to the pollutants HC, CO and NOx. Since a fixed quantity of gasoline contains a known amount of carbon and the total carbon emitted was measured, the amount of gasoline used to traverse a fixed distance an be determined by the carbon balance method. This method was employed and the fuel economy data are reported in terms of miles per gallon, i.e., the inverse of the variable gallons per mile which is measured. As previously mentioned, these data are summarized in terms of harmonic means and standard deviations using the methods defined in Reference (4).

As seen in the above mentioned Table 25, there is a general trend in fuel economy over programs which appears to be consistent for each model year. This profile includes an increase from FY71 to FY72 programs, a decrease from FY72 to FY73 programs, and an increase over the last three programs. This observation should also be tempered by the uncertainty involved with the estimates. A possible explanation of these results could reside in model mix from year to year.

From Table 26 an important genealization is that fuel economy increased in the period between the FY74 and FY75 programs for all model years except 1970. This is an increased for a specific sample of cars and the results are not confounded by varying model mix.

Table 27 presents the 1975 FTP emissions data and fuel economy by combinations of model year and 500 lb increments of inertia weight for the composite of all cities except Denver and Los Angeles The known effect of inertia weight on fuel economy can easily be seen in this table by observing the significant decreases in fuel economy as weight increases for any particular model year. If there is an adverse effect on fuel economy due to the addition of emission control devices, it cannot be detected in these data. In addition, there is some evidence of increased fuel economy for 1975 and 1976 model years within inertia weight groups. Tables 28 through 35 present summaries of the fuel economy data for each model year and city as well as the composite of all cities except Denver and Los Angeles. Included in these summaries are the cold transient, cold stabilized, and hot transient portions of the tests and the averages using the 1972 FTP and 1975 FTP weighting factors.

Perusal of these tables gives one the immediate impression that model year 1976 vehicles have distinctly higher fuel economy than all other model years. When comparing fuel economies across model years and across cities the only comparisons which are statistically significant are those between 1976 model year vehicles and any earlier model year group for the composite (all except Denver and Los Angeles) vehicles. This result reflects the fact that the comparisons among composite vehicles utilize the largest sample sizes and therefore are the most powerful tests statistically for detecting differences.

3.2.5 HIGHWAY FUEL ECONOMY TESTS

The Highway Fuel Economy Test was to be performed on forty-four 1976 model year vehicles (34 passenger cars and the 10 light duty trucks) in each city with the exception of Phoenix. The only deviation from this plan was that four of the light duty trucks from St. Louis were lost from the sample and not replaced. The passenger cars from Chicago and St. Louis were selected to correspond with the chacteristics of the other cities, thus permitting valid comparisons among cities. Details of the test procedure can be found in Reference (6).

The results of the HFET are summarized in Tables 36 and 42. For passenger cars, mean HC and CO in Denver were significantly higher and mean NOx lower than in the composite group consisting of vehicles from Chicago, Houston, St. Louis and Washington. Mean HC was significantly lower and NOx higher in Los Angeles than in the composite group. Mean CO was significantly higher in Washington than in St. Louis. There were no significant differences among cities for mean fuel economy.

To compare the HFET results with those from the 1975 FTP, the average 1975 FTP fuel economy was calculated for the same set of vehicles which had a HFET for each city. These data are summarized in Table 43 which also presents the ratio of the highway fuel economy to the 1975 FTP fuel economy. This ratio is relatively constant for all cities and indicates that the HFET yields results which are approximately 40% greater than those of the 1975 FTP. This result (i.e., HFET 40% greater than 1975 FTP) is equivalent to that found in the FY74 program for model year 1975 vehicles although both sets of fuel economies are generally higher in the FY75 program (see Reference 6).

3.2.6 MANUFACTURER EFFECTS

The emissions data for the 1976 model year vehicles were summarized for each manufacturer and these data are presented in Table 44 for the composite of all cities except Denver and Los Angeles, in Table 45 for Denver and Table 46 for Los Angeles. Similarly, the data for the light duty trucks are summarized in Tables 47 through 49. Other analyses were not performed on the Denver-Los Angeles and light duty truck data due to the small sample sizes.

Figure 1 presents 1976 model year emission averages and 95% confidence limits about the averages for each domestic manufacturer, the composite of foreign manufacturers, and the composite of domestic manufacturers. For FY74 data this type of analysis indicated that the foreign composite had significantly lower HC and CO emissions than the domestic composite. Although mean HC and CO emissions for the foreign 1976 model year vehicles are lower than the domestic composite, there is a large overlap in the confidence intervals and the difference is not significant. Of interest in Figure 1 is that Chrysler vehicles show significantly higher mean HC and CO emissions than any other group. For the composite of 431 domestic vehicles the arimetic means and standard deviations are as follows:

	MEAN	STANDARD DEVIATION
HC	1.36	1.05
CO	18.86	20.11
NOx	2.60	1.17

3.2.7 OWNERSHIP CHARACTERISTICS

As in the FY74 Emission Factor Program, each owner was required to complete a questionnaire concerning the vehicles' usage, maintenance, and damage history. The questions and response percentages are presented in Appendix II. The responses summarized are those given by the owners and as such the accuracy of the responses is not under program control. The extent to which owners misinterpret the questions or gave the answers they thought were "correct" rather than true is not known although there is some indication of both of these sources of inaccuracies. There is ostensible improvement in the FY75 Program responses in that fewer owners replied "don't know" to questions where such an answer was possible than in the FY74 Program. Most of this improvement is probably due to our new requirement for the questionnaire to be filled out by the contractor during an interview with the person most familiar with the use and maintenance of the vehicle. However, it is impossible to determine how much of this change is due to increased owner knowledge.

The purpose in obtaining the questionnaire response is to associate emission and fuel economy levels with various ownership characteristics. Efforts along these lines must be questioned based upon the sources of inaccuracies cited in the preceding paragraph. With this qualification results of such analysis based upon parametric and non-parametric analysis of variance and "eyeballing" of means and standard deviations will be presented in the following paragraphs.

For model year groups prior to 1975 very few signficiant trends or differences were located. Those significant items which did show up were for isolated model years and could reasonably be attributed to randomness. For model years 1975 and 1976, many of the maintenance type classifications (e.g., frequency of oil change, frequency of tuneup, etc.) appeared to account for nominally significant differences in mean emission levels although such significance appears generally to be a result of the response categories tendency to group vehicles into age and mileage categories. In the FY74 Emission Factor Program (see Reference 6) questions relating to use of leaded fuel and hydrogen sulfide odor were found to account for signficant differences in mean emission levels for model year 1975 vehicles. In the FY75 Program there was too little variability in response to the use of leaded fuel question to permit proper analysis. However, analysis of emissions with respect to hydrogen sulfide odor tended to support the previous findings. Tables 50 and 51 present mean emission levels and fuel economy for all 1975 and 1976 model year vehicles grouped on the basis of the owner's response to the

question. For both model years, vehicles in the "regularly" category have significantly higher mean HC emissions than vehicles in other categories. There appeared to be no other significant differences accountable to this question.

Although the answers to the questions appeared to show little relationship to emission levels, interesting results are discussed in References 10 and 11 with respect to the relationships of questionnaire responses to comparisons amoung EPA measured, certification, and owner perceived fuel economies.

3.2.8 MODAL EMISSION SEQUENCE

To develop models which are capable of predicting emissions/fuel economy over arbitrary driving sequences, it is necessary to have available emission factors from a variety of steady states and driving modes (see References (8) and (9)). The Surveillance Driving Sequence (SDS) has been established and is composed of average acceleration/deceleration transition rates between all combinations of 0 mph, 15 mph, 30 mph, 45 mph, and 60 mph. In addition, acceleration/deceleration rates both higher and lower than the average values were defined as transitions between all pair combinations of 0 mph, 30 mph, and 60 mph. The SDS for transitions thus consists of 32 acceleration/deceleration modes and 7 (seven) steady conditions defined as idle, 5 mph, 10 mph, 15 mph, 30 mph 45 mph, and 60 mph. Table 52 lists the various transition modes of the sequence with the corresponding time in mode, average speed, average acceleration/deceleration rates, and distance traveled.

Modal Tests were performed on the same vehicles that were subjected to the Highway Fuel Economy Test in Chicago, Houston, and Washington. All vehicles from Denver and Los Angeles underwent the Modal Tests. Modal tests were administered to a sample similar to the Los Angeles and Denver samples in St. Louis. Tables 53 through 83 present the average emission and fuel economy obtained in each mode of the Surveillance Driving Sequence. Each table represents a city - model year combination.

3.2.9 EVAPORATIVE EMISSIONS

The venting of fuel vapors from the carburetor front chamber and vehicle fuel tank can constitute a sizable source of HC emissions in the absence of appropriately functioning control devices. A determination of the mean evaporative losses was made for twenty 1976 model year cars in both Denver and Los Angeles. Two types of losses were measured while the vehicles were enclosed in the Sealed Housing for Evaporative Determinations (SHED). Losses occurring over a one hour period while fuel (in the vehicle tank) was raised in temperature according to a prescribed schedule are termed Diurnal Soak Losses. Losses occurring during a one hour period while the vehicle cools following the completion of a complete cold start 1975 FTP are termed Hot Soak Losses. Further details concerning the test procedure can be found in References (1) and (2).

Summary results from the SHED tests are presented in Table 84. Also included are the means and standard deviations for Combined Losses which are the results of calculations from each vehicle which are intended to

represent the total average loss for a vehicle in a day. All three mean losses are significantly higher for Denver than for Los Angeles as would be expected due to the altitude difference.

3.2.10 SULFATE EMISSIONS

With increased concern about acidic rain and lack of information about the effects of pollution control devices and unleaded fuels, sulfate emission levels are an important issue. All 1975 and 1976 vehicles in the samples from Denver, Houston, St. Louis and Phoenix which were operated on unleaded fuel and which, upon arrival at the test facility, had fuel which contained less than 0.05 grams of lead per gallon, were tested for sulfates. These vehicles were tested over the Congested Freeway Driving schedule.

Tables 85 through 87 present the results from the tests for 1975 and 1976 model years and light duty trucks. Means and standard deviations for HC, CO, NOx, fuel economy, and H_2SO_4 are presented separately by city for vehicles with and without air pumps. The composite group shown in each table consists of the appropriate vehicles from Houston, St. Louis, and Phoenix.

The general trends in evidence are that mean HC and CO levels are lower while mean sulfate levels are higher for vehicles with air pumps than for those without air pumps. The following results were found in comparing the air pump groups with the no air pump groups. NOx and fuel economy showed no significant differences. HC and CO differences were statistically significant for all Denver comparisons except CO for light duty trucks. None of the Denver sulfate comparisons were statistically significant. For composite vehicles (i.e., vehicles from Houston, St. Louis and Phoenix) the CO comparison was statistically significant from all three tables, the HC comparison was statistically significant for model year 1975 cars, and the sulfate comparison was statistically significant for both 1975 and 1976 model year cars.

3.2.11 SHORT CYCLE TESTS

Section 207(b) of the Clean Air Act specifies that the EPA can develop regulations requiring manufacturers to cover repair costs for vehicles which are penalized for failing a FTP correlatable short emission test so long as those vehicles have been properly maintained and used. As prerequisite for promulgation of such regulations the CAA states that short test methods and procedures must be developed with the essential requirements of "availability", "conformance with good engineering practices", and "reasonable correlation with certification test procedures". To provide information concerning the correlation aspects of certain tests which are believed to satisfy these requirements, seven short cycle tests were administered as part of the FY75 EFP.

Comparisons of short test results with FTP results take two general forms. Conventional correlation analysis attempts to determine the actual correspondence of short test data to FTP data. Contingency table analysis evaluates the ability of a short test to correctly pass or fail vehicles with the FTP criterion as a standard. The former is a measurement of the pure tracking ability of the short test with respect to the FTP while the latter is an investigation of the tests' ability to make proper decisions and the relative frequency of different sorts of errors. It should be emphasized that in the latter sort of analysis the algorithm for decision making is evaluated in addition to the actual emission test results. The nature and scope of this report allow only for a representative presentation of each of the two types of analysis.

Table 88 presents the product-moment sample correlation coefficients by individual emissions and for each mode of the multiple mode tests. The correlations shown are for the group of all vehicles tested. Correlations from single mode tests are nearly all above 0.800 with the Federal Short Cycle and the New York City Cycle tests both showing consistently higher correlations than the New Jersey Acid/New York Cycle Composite Test for CO and NOx while HC correlation is slightly higher for the NJ/NY then for the New York City. Individual modes of the multiple mode tests show correlations ranging sporadically between 0.070 and 0.850. Although individual modes of the multiple mode tests show lower correlations than the single mode tests, appropriate combinations of the individuals mode results can be defined which result in emission levels that track the FTP as well or better than single mode tests.

Tables 89 through 95 present the results of a form of contingency table analysis developed at EPA. This analysis includes the procedure whereby short test emission results are utilized in passing or failing the vehicle. For the purposes of this presentation, 30% of the 1975 and 1976 model year vehicles tested by each short test were designated as failed according to the prescribed procedure. The remainder were designated as passed by each short test. In the tables, the sample sizes are exhibited as cross-classified by the short test pass/fail designation and the pass/fail 1975 FTP Standards designation for each vehicle. The emission numbers following these sample sizes are the "nondimensionalized" emission totals of interest in determining the ability of the test to correctly identify excess emissions. The philosophical emphasis in this method of analysis is the identification of a maximal portion of the excess emissions. The interpretation of the emissions figures in the tables for each group of vehicles is as follows:

Fail/Fail - relative amount of emissions in excess of standards correctly identified.

Pass/Pass - relative margin of emissions by which vehicles passing the short test passed FTP standards.

Incorrect Pass - relative emissions in excess of FTP standards contributed by vehicles incorrectly passed by the short test (error of omission), and

Incorrect Fail - relative margin of emissions by which vehicles incorrectly failed by the short test passed FTP standards (error of comission).

Thus, the worth of the short test is evaluated positively on the basis of relatively large (in absolute magnitutde) emission figures in the Pass/Pass and Fail/Fail cells of the table and relatively small (in absolute magnitude) emissions figures in the incorrectly designated cells. A more traditional measure, number of errors of comission/ (number of errors of comission + number of fail-fail vehicles), is a measure of the burden on the manufacturers. This measure is very low for Tables 86 through 95 with the maximum being .12. Two points should be emphasized. This analysis is not of the pure test results but is influenced by the internal methodology of designating pollutant specific short test passing and failing points. Further, this analytic tool does not obviate the need for policy decisions as to the relative value of different types of errors. This valuation is still left to the judgment of the user of the data.

It should be noted that the repeatability of the short tests is generally very poor. Also, the short tests as administered in the Emission Factor program are subject to a great deal of quality control. The procedures with the garage type instruments as envisioned in the warranty provisions would be subject to very little review in terms of such measures as periodic calibration. Hence, the proposed procedures would probably be much more variable than the results represented in this report.

REFERENCES

1. Study of Exhaust Emissions from 1966 through 1976 Model Year Light Duty Vehicles in Denver, Chicago, Houston, and Phoenix, EPA-460/3-77-005, August 1977.

2. Study of Exhaust Emissions from 1966 through 1976 Model Year Light Duty Vehicles in Los Angeles, St. Louis, and Washington, D.C. EPA-460/3-77-004.

3. Automobile Exhaust Emission Surveillance - A Summary, EPA Report APTD-1544.

4. Automobile Exhaust Emission Surveillance - Analysis of the FY72 Program, EPA Report EPA-460/2-74-001.

5. Automobile Exhaust Emission Surveillance - Analysis of the FY73 Program, EPA Report EPA-460/3-75-007.

6. Automobile Exhaust Emission Surveillance - Analysis of the FY74 Program, EPA Report EPA-460/3-76-019.

7. Lilliefors, Hubert W., "On the KolmogorovSmirnov Test for Normality with Mean and Variance Unknown," Journal of the American Statistical Association 6Z: 339402.

8. Automobile Exhaust Emission Modal Analysis Model, EPA Report EPA-460/3-74-005, January 1974.

9 Automobile Exhaust Emission Modal Analysis Model Extension and Refinement, EPA Report EPA-460/3-74-024, October 1974.

10. Comparison of EPA Measured Fuel Economy with the Mileage Guide, CAB Technical Report, August, 1977.

11. Comparison of Owner Perceived and EPA Measured Fuel Economy, CAB Technical Report, August, 1977.

12. Edit Procedures Applied to In-Use Vehicle Data, CAB Internal Report, April, 1977.

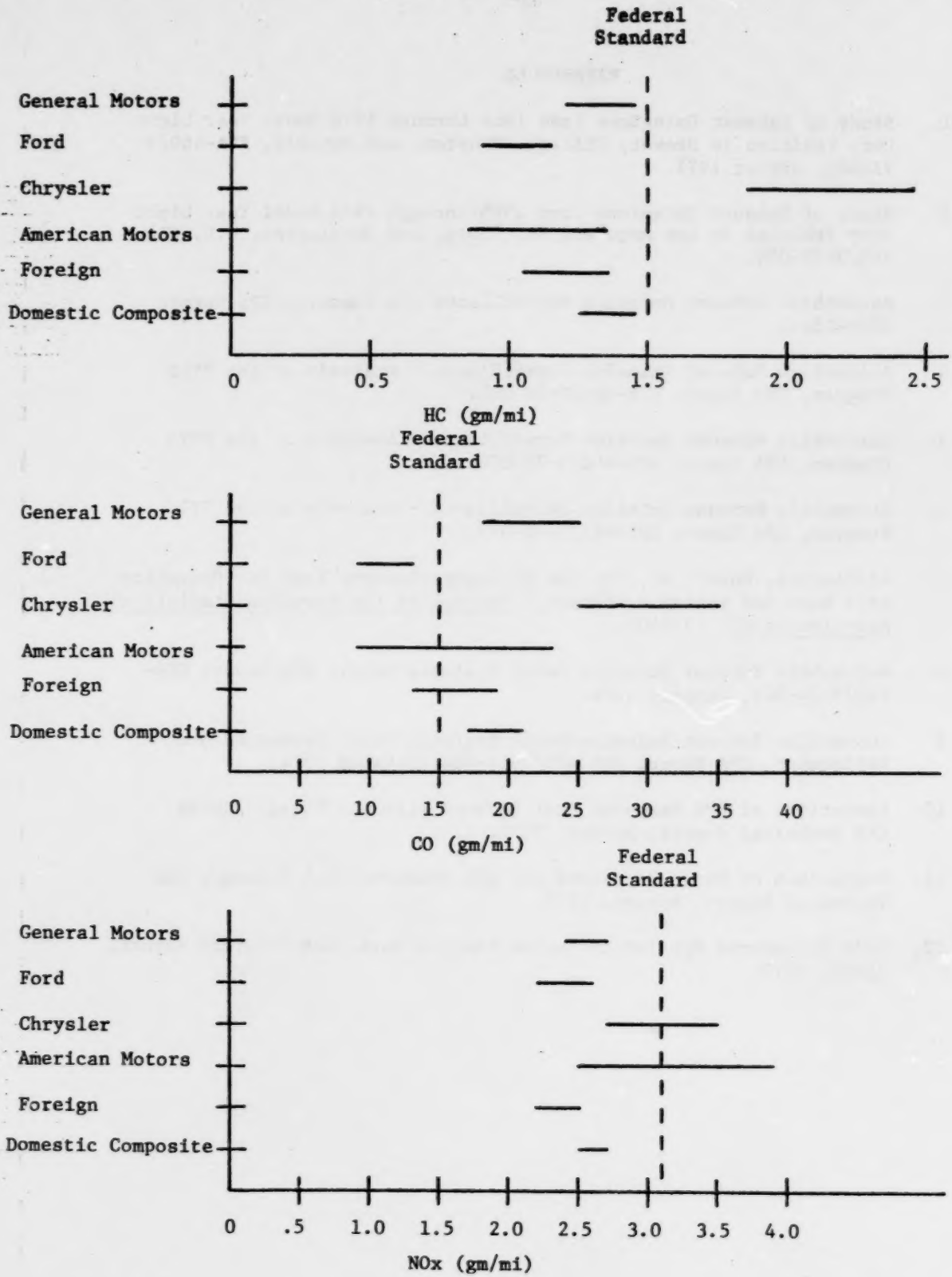

Figure 1 Average Emission and 95% Confidence Limits for Manufacturers 1976 Model Year Vehicles, 1975 FTP

Table 1

Number of EF75 Vehicles Tested by Site and Model Year

	MODEL YEAR											
Site	76	76LDT	75	75LDT	74	73	72	71	70	69	66-68	TOTAL
Chicago	150	10	50	7	50	50	45	40	35	30	50	517
Denver	34	10	28	7	27	27	25	22	20	0	0	200
Houston	34	10	28	7	27	27	0	0	0	0	0	133
Los Angeles	34	10	28	7	27	27	25	22	20	0	0	200
St. Louis	146	7	48	6	50	50	45	40	34	30	50	506
Washington	34	10	28	7	27	27	0	0	0	0	0	133
Phoenix	151	0	49	0	50	50	45	40	35	30	49	499
Total	583	57	259	41	258	258	185	164	144	90	149	2188

Table 2

FY75 EMISSION FACTOR PROGRAM
SUMMARY TABLE OF EMISSION LEVELS USING
THE 1975 FTP FOR 1976 MODEL YEAR AUTOMOBILES

City	Number of Vehicles Tested	Mean Miles (Thousands)	Hydrocarbons GMS/MI Arithmetic Mean	Hydrocarbons GMS/MI Arithmetic S.D.	Carbon Monoxide GMS/MI Arithmetic Mean	Carbon Monoxide GMS/MI Arithmetic S.D.	NOx GMS/MI Arithmetic Mean	NOx GMS/MI Arithmetic S.D.	Fuel Economy MI/GAL Harmonic Mean	Fuel Economy MI/GAL Harmonic S.D.	Idle Hydrocarbons Parts per Million Hexane Mean	Idle Hydrocarbons Parts per Million Hexane S.D.	Idle Carbon Monoxide Percent CO Mean	Idle Carbon Monoxide Percent CO S.D.
Chicago	150	7.3	1.27	0.97	19.23	21.40	2.46	0.92	15.01	3.42	177	195	2.09	2.01
Houston	34	11.5	1.78	1.30	20.81	19.45	2.76	1.14	14.32	3.27	200	209	2.77	3.36
Phoenix	151	12.8	1.22	0.97	15.10	14.91	2.51	1.08	15.02	3.36	120	169	1.31	2.35
St. Louis	146	16.1	1.52	0.96	21.59	20.67	2.63	1.33	14.70	3.30	-	-	-	-
Washington, DC	34	4.8	0.93	0.61	11.69	12.65	2.73	1.03	15.07	3.25	77	74	0.75	1.93
5* Cities Averaged	515	11.5	1.34	0.99	18.30	19.03	2.56	1.12	14.88	3.34	-	-	-	-
4* Cities Averaged	369	9.7									146	181	1.71	2.75
Los Angeles	34	8.7	0.72	0.40	7.95	8.12	1.57	0.64	14.02	3.34	69	93	0.88	1.73
Denver	34	10.9	2.34	1.23	45.09	25.40	1.82	0.72	15.19	3.40	303	355	3.44	3.20

* Idle measurements are only averaged for four cities—St. Louis is deleted.

TABLE 3
MEAN EMISSIONS AFTER APPROXIMATELY ONE YEAR OF OPERATION
FROM EMISSION FACTOR PROGRAMS---1975 FTP

Location	Average Mileage (Thousands)	HC GM/MI	CO GM/MI	NOX GM/MI
City Composite*				
FY 71 EFP, 1971 Models	15.6	3.07	39.56	5.06
FY 72 EFP, 1972 Models	14.8	3.02	36.88	4.55
FY 73 EFP, 1973 Models	18.1	3.59	46.96	3.47
FY 74 EFP, 1974 Models	20.2	3.58	41.77	2.89
FY 74 EFP, 1975 Models	8.8	1.32	22.92	2.44
FY 75 EFP, 1976 Models	11.5	1.34	18.30	2.56
Denver				
FY 71 EFP, 1971 Models	15.2	5.59	88.13	3.05
FY 72 EFP, 1972 Models	14.1	4.75	80.36	3.08
FY 73 EFP, 1973 Models	14.3	4.54	84.70	1.96
FY 74 EFP, 1974 Models	24.6	5.15	83.67	1.85
FY 74 EFP, 1974 Models	13.5	2.22	48.52	1.62
FY 75 EFP, 1976 Models	10.9	2.34	45.09	1.82
Los Angeles				
FY 71 EFP, 1971 Models	15.8	3.02	42.26	3.83
FY 72 EFP, 1972 Models	17.6	3.56	46.68	3.81
FY 73 EFP, 1973 Models	21.5	3.85	39.39	3.04
FY 74 EFP, 1974 Models	22.6	2.57	37.05	2.47
FY 74 EFP, 1975 Models	8.1	0.52	6.59	2.38
FY 75 EFP, 1976 Models	8.7	0.72	7.95	1.57

*FY 71 and FY 72 -- Chicago, Houston, St. Louis, Washington, D.C.
FY 73 -- Detroit, Houston, St. Louis, Newark
FY 74 and FY 75 -- Chicago, Houston, Phoenix, St. Louis, Washington, D.C.

Table 4

Summary of Federal 49 State Standards
and 1975 California Standards

		HC	CO	NOx
Federal	1972 (1972 FTP)	3.4	39.0	-
49 State	1973/1974 (1972 FTP)	3.4	39.0	3.0
	1975 (1975 FTP)	1.5	15.0	3.1
	1975 Trucks (1975 FTP)	2.0	20.0	3.1
California	1975 (1975 FTP)	0.9	9.0	2.0
	1975 Trucks (1975 FTP)	2.0	20.0	2.0

Table 5

PERCENT OF 1976 MODEL YEAR VEHICLES
MEETING STANDARDS -- 1975 FTP

	Meeting 1975 Federal 49 State Standards			Meeting 1975 California Standards
Pollutant	Five City Composite (515 Vehicles)	Denver (34 Vehicles)	Los Angeles (34 Vehicles)	Los Angeles (34 Vehicles)
HC	73% or 374	32% or 11	97% or 33	85% or 29
CO	62% or 317	15% or 5	91% or 31	79% or 27
NOx	81% or 416	94% or 32	94% or 32	91% or 31
All Three	47% or 243	15% or 5	85% or 29	71% or 24

Table 6

STATISTICAL DISTRIBUTION* OF EMISSION DATA FROM
FY75 EMISSION FACTOR PROGRAM BY CITY, YEAR AND POLLUTANT

	Chicago	Denver	Houston	LA	St. Louis	Washington	Phoenix
65-68 N	50	0	0	0	50	0	49
HC	L	-	-	-	L	-	L
CO	NL	-	-	-	L	-	NL
NOX	NL	-	-	-	NL	-	NL
1969 N	30	0	0	0	30	0	30
HC	U	-	-	-	L	-	NL
CO	NL	-	-	-	NL	-	L
NOX	NL	-	-	-	NL	-	NL
1970 N	35	20	0	20	34	0	35
HC	L	NL	-	L	L	-	L
CO	NL	NL	-	NL	NL	-	L
NOX	NL	NL	-	NL	NL	-	NL
1971 N	40	22	0	22	40	0	40
HC	U	U	-	L	L	-	NL
CO	NL	NL	-	L	L	-	NL
NOX	NL	NL	-	NL	NL	-	NL
1972 N	45	25	0	25	45	0	45
HC	L	U	-	NL	L	-	L
CO	NL	NL	-	NL	L	-	NL
NOX	NL	NL	-	NL	NL	-	NL
1973 N	50	27	27	27	50	27	50
HC	L	NL	NL	U	NL	NL	L
CO	NL	NL	NL	L	N	NL	L
NOX	NL	NL	NL	L	NL	NL	L
1974 N	50	27	27	27	50	27	50
HC	U	NL	NL	U	L	NL	U
CO	L	NL	NL	NL	L	NL	L
NOX	NL	NL	NL	NL	NL	NL	NL
1975 N	50	28	28	28	48	28	49
HC	L	L	L	NL	L	L	L
CO	L	NL	NL	NL	L	L	L
NOX	NL	NL	NL	L	NL	L	L

		Chicago	Denver	Houston	LA	St. Louis	Washington	Phoenix
1976	N	150	34	34	34	146	34	151
	HC	L	NL	N	L	L	L	L
	CO	L	NL	NL	L	L	L	L
	NOx	L	L	NL	L	L	L	L
LDT	N	17	17	17	17	13	17	0
	HC	NL	NL	NL	L	NL	U	-
	CO	L	NL	NL	L	NL	NL	-
	NOx	NL	NL	NL	NL	NL	NL	-

*The distributions listed could not be rejected at the nominal .01 level. N - normal not rejected. L - lognormal not rejected.
U - unclassified, both distributions rejected.
Note that N in the left margin indicates sample size.

Table 7
FY75 Emission Factor Program
Emission Results for Chicago
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	77.9	7.39	5.68	6.31	1.67	87.87	45.31	75.11	1.89	3.39	1.44	3.07	1.60
1969	30	62.2	6.11	5.59	5.11	1.65	58.32	26.98	52.81	1.58	4.71	1.89	4.34	1.52
1970	35	57.9	5.76	4.71	4.83	1.71	65.56	33.78	58.14	1.65	3.55	1.43	3.24	1.50
1971	40	55.9	4.87	5.82	3.92	1.67	49.92	22.69	44.45	1.68	4.10	1.54	3.83	1.47
1972	45	42.1	3.64	2.02	3.29	1.53	47.08	28.18	39.37	1.86	4.05	1.41	3.83	1.40
1973	50	34.1	3.54	4.07	2.94	1.64	40.15	23.79	33.88	1.81	2.83	1.10	2.62	1.50
1974	50	24.0	3.82	4.18	3.13	1.69	38.68	23.36	33.02	1.78	2.87	1.24	2.61	1.50
1975	50	15.9	1.59	1.94	1.14	2.09	22.11	23.89	14.44	2.54	2.31	1.07	2.10	1.56
1976	150	7.3	1.27	0.97	1.00	1.97	19.23	21.40	11.23	2.96	2.46	0.92	2.31	1.43
LDT*	17	11.2	1.22	0.98	0.97	1.94	18.64	16.80	13.56	2.27	2.02	0.55	1.94	1.35

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 8
FY75 Emission Factor Program
Emission Results for Denver
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	73.4	6.05	2.09	5.73	1.41	85.37	36.08	77.02	1.65	2.73	0.90	2.58	1.43
1971	22	58.8	6.91	3.66	6.21	1.57	94.42	59.37	82.50	1.66	2.58	1.02	2.32	1.78
1972	25	46.1	5.65	3.78	5.01	1.56	71.62	21.47	68.62	1.35	2.74	0.92	2.59	1.41
1973	27	39.3	4.71	1.75	4.43	1.43	82.18	38.30	73.44	1.65	2.20	1.08	1.96	1.65
1974	27	28.2	4.64	1.55	4.39	1.41	81.42	27.38	76.99	1.41	2.03	1.08	1.81	1.62
1975	28	19.6	2.37	1.16	2.11	1.65	47.86	27.67	39.70	2.01	1.81	0.68	1.68	1.55
1976	34	10.9	2.34	1.23	2.06	1.68	45.09	25.40	37.34	1.99	1.82	0.72	1.69	1.48
LDT*	17	13.7	2.18	1.15	1.92	1.69	39.82	24.69	32.11	2.11	1.79	0.78	1.68	1.45

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 9
FY75 Emission Factor Program
Emission Results for Houston
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	51.6	5.03	6.01	3.79	1.90	60.39	40.63	49.75	1.87	2.65	1.11	2.44	1.52
1974	27	35.6	4.19	2.00	3.81	1.55	64.32	41.20	53.96	1.81	2.57	1.31	2.28	1.66
1975	28	28.5	1.88	1.17	1.62	1.74	32.91	32.48	23.57	2.32	2.55	1.09	2.36	1.49
1976	34	11.5	1.78	1.30	1.44	1.93	20.81	19.45	12.49	3.07	2.76	1.14	2.56	1.48
LDT*	17	18.4	2.65	2.29	1.96	2.18	37.58	44.51	17.80	3.98	2.87	0.97	2.71	1.42

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 10
FY75 Emission Factor Program
Emission Results for Los Angles
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	75.9	5.59	4.93	4.71	1.66	53.84	32.39	46.07	1.79	4.46	1.39	4.27	1.35
1971	22	68.9	8.88	13.31	5.15	2.45	75.75	62.59	56.02	2.27	3.67	1.46	3.37	1.57
1972	25	58.7	3.16	1.22	2.94	1.47	42.21	21.36	36.89	1.73	3.30	1.13	3.12	1.41
1973	27	47.5	4.38	5.58	3.42	1.75	48.61	26.98	42.34	1.72	3.26	1.69	2.87	1.68
1974	27	32.0	4.84	6.65	3.30	2.11	41.19	19.10	36.71	1.67	2.20	1.23	1.91	1.71
1975	28	16.2	0.68	0.32	0.60	1.65	7.90	6.43	5.82	2.22	1.99	1.10	1.79	1.56
1976	34	8.7	0.72	0.40	0.64	1.58	7.95	8.12	5.98	2.05	1.57	0.64	1.48	1.39
LDT*	17	14.1	1.15	0.98	0.89	1.98	18.75	27.59	9.82	2.89	1.93	1.10	1.68	1.71

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 11
FY75 Emission Factor Program
Emission Results for St. Louis
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	84.9	9.23	8.37	7.34	1.84	114.48	70.28	95.41	1.88	3.54	2.11	2.93	1.92
1969	30	84.3	5.98	6.17	4.88	1.73	71.63	39.38	61.23	1.80	4.24	1.74	3.88	1.55
1970	34	65.5	6.15	5.01	5.14	1.72	82.06	60.58	68.25	1.82	3.77	1.28	3.52	1.51
1971	40	66.3	5.80	6.00	4.55	1.85	66.87	47.69	56.30	1.78	4.01	1.48	3.63	1.70
1972	45	58.5	4.29	2.79	3.81	1.56	57.23	38.34	48.24	1.81	4.79	1.76	4.48	1.46
1973	50	45.3	3.58	1.35	3.33	1.47	51.34	23.63	45.28	1.73	3.37	1.35	3.12	1.50
1974	50	35.8	4.25	2.78	3.77	1.56	60.49	45.92	47.54	2.02	3.08	1.47	2.76	1.62
1975	48	23.9	1.83	1.53	1.47	1.90	34.40	63.24	18.88	2.78	2.67	1.26	2.40	1.62
1976	146	16.1	1.52	0.96	1.27	1.87	21.59	20.67	13.68	2.80	2.63	1.33	2.38	1.55
LDT*	13	15.0	1.79	1.13	1.50	1.85	33.28	26.02	23.88	2.43	2.50	1.05	2.35	1.42

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 12
FY75 Emission Factor Program
Emission Results for Washington
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	46.6	3.14	1.30	2.90	1.52	48.56	29.21	39.55	2.01	3.12	1.11	2.91	1.48
1974	27	28.8	3.23	1.08	3.05	1.41	41.59	25.24	35.48	1.79	3.13	1.51	2.80	1.64
1975	28	19.2	1.60	1.29	1.24	2.03	23.47	21.45	16.12	2.48	2.72	1.45	2.44	1.60
1976	34	4.8	0.93	0.61	0.80	1.74	11.69	12.45	7.77	2.48	2.73	1.03	2.59	1.38
LDT*	17	9.4	1.03	0.73	0.82	1.97	13.79	12.29	9.24	2.90	2.42	0.79	2.32	1.36

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 13
FY75 Emission Factor Program
Emission Results for Phoenix
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	49	92.4	6.20	2.76	5.71	1.49	93.53	49.50	82.05	1.68	2.54	1.18	2.27	1.66
1969	30	84.7	5.22	2.07	4.88	1.45	80.17	50.75	69.17	1.69	3.45	1.40	3.19	1.51
1970	35	75.5	5.45	3.30	4.79	1.63	77.51	59.01	61.39	2.04	3.18	1.28	2.88	1.66
1971	40	68.8	3.84	1.10	3.70	1.31	51.57	24.56	46.49	1.59	3.39	1.30	3.16	1.46
1972	45	56.1	3.53	1.80	3.25	1.47	47.50	21.50	42.84	1.60	3.25	1.08	3.08	1.40
1973	50	44.0	3.35	1.45	3.11	1.45	50.08	32.92	41.85	1.84	2.82	1.21	2.54	1.66
1974	50	34.8	4.11	3.64	3.33	1.80	56.56	38.31	47.07	1.82	2.81	1.40	2.50	1.63
1975	49	25.8	1.73	1.20	1.40	1.92	25.12	22.50	16.74	2.56	2.76	1.32	2.50	1.58
1976	151	12.8	1.22	0.97	0.99	1.83	15.10	14.91	10.07	2.50	2.51	1.08	2.34	1.46
LDT*	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 14
FY75 Emission Factor Program
Emission Results for All Cities Except Denver and Los Angeles
1975 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	149	85.0	7.62	6.16	[illegible]43	1.69	98.66	56.94	83.79	1.83	3.16	1.67	2.73	1.75
1969	90	77.1	5.77	4.91	4.95	1.60	70.04	40.79	60.70	1.70	4.13	1.75	3.77	1.55
1970	104	66.3	5.78	4.36	4.91	1.68	74.98	52.45	62.40	1.84	3.50	1.34	3.20	1.59
1971	120	63.7	4.84	4.89	4.04	1.64	56.12	34.21	48.82	1.69	3.84	1.47	3.53	1.55
1972	135	52.2	3.82	2.25	3.44	1.52	50.61	30.29	43.33	1.77	4.03	1.57	3.75	1.46
1973	204	43.2	3.65	3.18	3.17	1.58	49.12	29.86	41.14	1.85	2.97	1.21	2.73	1.55
1974	204	31.7	3.97	3.17	3.40	1.64	52.19	37.35	42.43	1.90	2.90	1.38	2.60	1.62
1975	203	22.4	1.72	1.49	1.35	1.96	27.42	37.65	17.32	2.57	2.59	1.24	2.34	1.58
1976	515	11.5	1.34	0.99	1.08	1.91	18.30	19.03	11.30	2.78	2.56	1.12	2.37	1.47
LDT*	64	13.4	1.66	1.54	1.22	2.14	25.36	29.05	14.77	3.01	2.45	0.88	2.31	1.41

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 15
FY75 Emission Factor Program
Chicago

YEAR	PERCENT MEETING FEDERAL 49 STATE STANDARDS					
	1972 FTP TEST DATA PASSED 1972* STANDARDS		1972 FTP TEST DATA PASSED 1973/1974** STANDARDS		1975 FTP TEST DATA PASSED 1975*** STANDARDS	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
66-68	3	6.00	0	0.0	0	0.0
1969	0	0.0	0	0.0	0	0.0
1970	3	8.57	1	2.86	0	0.0
1971	5	12.50	1	2.50	0	0.0
1972	12	26.67	3	6.67	0	0.0
1973	11	22.00	7	14.00	0	0.0
1974	20	40.00	7	14.00	1	2.00
1975	41	82.00	32	64.00	19	38.00
1976	121	80.67	97	64.67	78	52.00
75LDT*	13	76.47	11	64.71	13	76.47

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 16
FY75 Emission Factor Program
Denver

	PERCENT MEETING FEDERAL 49 STATE STANDARDS					
YEAR	1972 FTP TEST DATA PASSED 1972* STANDARDS NUMBER	PERCENT	1972 FTP TEST DATA PASSED 1973/1974** STANDARDS NUMBER	PERCENT	1975 FTP TEST DATA PASSED 1975*** STANDARDS NUMBER	PERCENT
66-68	0	0.0	0	0.0	0	0.0
1969	0	0.0	0	0.0	0	0.0
1970	0	0.0	0	0.0	0	0.0
1971	0	0.0	0	0.0	0	0.0
1972	0	0.0	0	0.0	0	0.0
1973	4	14.81	3	11.11	0	0.0
1974	0	0.0	0	0.0	0	0.0
1975	10	35.71	10	35.71	1	3.57
1976	12	35.29	12	35.29	5	14.71
75LDT*	6	35.29	5	29.41	4	23.53

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 17
FY75 Emission Factor Program
Houston

PERCENT MEETING FEDERAL 49 STATE STANDARDS

YEAR	1972 FTP TEST DATA PASSED 1972* STANDARDS NUMBER	PERCENT	1972 FTP TEST DATA PASSED 1973/1974** STANDARDS NUMBER	PERCENT	1975 FTP TEST DATA PASSED 1975*** STANDARDS NUMBER	PERCENT
66-68	0	0.0	0	0.0	0	0.0
1969	0	0.0	0	0.0	0	0.0
1970	0	0.0	0	0.0	0	0.0
1971	0	0.0	0	0.0	0	0.0
1972	0	0.0	0	0.0	0	0.0
1973	7	25.93	4	14.81	0	0.0
1974	3	11.11	3	11.11	0	0.0
1975	16	57.14	12	42.86	6	21.43
1976	24	70.59	17	50.00	13	38.24
75LDT*	10	58.82	7	41.18	5	29.41

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 18
FY75 Emission Factor Program
Los Angeles

	PERCENT MEETING FEDERAL 49 STATE STANDARDS					
	1972 FTP TEST DATA PASSED 1972* STANDARDS		1972 FTP TEST DATA PASSED 1973/1974** STANDARDS		1975 FTP TEST DATA PASSED 1975*** STANDARDS	
YEAR	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
66-68	0	0.0	0	0.0	0	0.0
1969	0	0.0	0	0.0	0	0.0
1970	1	5.00	1	5.00	0	0.0
1971	3	13.64	0	0.0	0	0.0
1972	6	24.00	5	20.00	1	4.00
1973	6	22.22	4	14.81	0	0.0
1974	5	18.52	5	18.52	1	3.70
1975	27	96.43	24	85.71	21	75.00
1976	32	94.12	30	88.24	29	85.29
75LDT*	15	88.24	12	70.59	11	64.71

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 19
FY75 Emission Factor Program
St. Louis

	PERCENT MEETING FEDERAL 49 STATE STANDARDS					
YEAR	1972 FTP TEST DATA PASSED 1972* STANDARDS NUMBER	PERCENT	1972 FTP TEST DATA PASSED 1973/1974** STANDARDS NUMBER	PERCENT	1975 FTP TEST DATA PASSED 1975*** STANDARDS NUMBER	PERCENT
66-68	1	2.00	0	0.0	0	0.0
1969	1	3.33	0	0.0	0	0.0
1970	2	5.88	0	0.0	0	0.0
1971	3	7.50	1	2.50	1	2.50
1972	7	15.56	1	2.22	0	0.0
1973	6	12.00	2	4.00	0	0.0
1974	12	24.00	8	16.00	0	0.0
1975	32	66.67	20	41.67	11	22.92
1976	109	74.66	74	50.68	56	38.36
75LDT*	7	53.85	5	38.46	6	46.15

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 20
Fy75 Emission Factor Program
Washington

PERCENT MEETING FEDERAL 49 STATE STANDARDS						
	1972 FTP TEST DATA PASSED 1972* STANDARDS		1972 FTP TEST DATA PASSED 1973/1974** STANDARDS		1975 FTP TEST DATA PASSED 1975*** STANDARDS	
YEAR	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
66-68	0	0.0	0	0.0	0	0.0
1969	0	0.0	0	0.0	0	0.0
1970	0	0.0	0	0.0	0	0.0
1971	0	0.0	0	0.0	0	0.0
1972	0	0.0	0	0.0	0	0.0
1973	7	25.93	4	14.81	2	7.41
1974	10	37.04	3	11.11	0	0.0
1975	20	71.43	18	64.29	10	35.71
1976	32	94.12	22	64.71	20	58.82
75LDT*	16	94.12	13	76.47	11	64.71

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 21
FY75 Emission Factor Program
Phoenix

YEAR	1972 FTP TEST DATA PASSED 1972* STANDARDS NUMBER	PERCENT	1972 FTP TEST DATA PASSED 1973/1974** STANDARDS NUMBER	PERCENT	1975 FTP TEST DATA PASSED 1975*** STANDARDS NUMBER	PERCENT
	PERCENT MEETING FEDERAL 49 STATE STANDARDS					
66-68	0	0.0	0	0.0	0	0.0
1969	1	3.33	1	3.33	0	0.0
1970	2	5.71	0	0.0	0	0.0
1971	3	7.50	1	2.50	0	0.0
1972	7	15.56	2	4.44	0	0.0
1973	16	32.00	10	20.00	0	0.0
1974	11	22.00	8	16.00	0	0.0
1975	32	65.31	22	44.90	15	30.61
1976	133	88.08	96	63.58	76	50.33
75LDT*	0	0.0	0	0.0	0	0.0

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 22
FY75 Emission Factor Program
All Cities Except Denver & Los Angles

	PERCENT MEETING FEDERAL 49 STATE STANDARDS					
	1972 FTP TEST DATA PASSED 1972* STANDARDS		1972 FTP TEST DATA PASSED 1973/1974** STANDARDS		1975 FTP TEST DATA PASSED 1975*** STANDARDS	
YEAR	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
66-68	4	2.68	0	0.0	0	0.0
1969	2	2.22	1	1.11	0	0.0
1970	7	6.73	1	0.96	0	0.0
1971	11	9.17	3	2.50	1	0.83
1972	26	19.26	6	4.44	0	0.0
1973	47	23.04	27	13.24	2	0.98
1974	56	27.45	29	14.22	1	0.49
1975	141	69.46	104	51.23	61	30.05
1976	419	81.36	306	59.42	243	47.18
75LDT*	46	71.88	36	56.25	35	54.69

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

* The 1972 Standards are 3.4 gm/mi for HC and 39 gm/mi for CO
** The 1973/74 Standards are 3.4 gm/mi for HC, 39 gm/mi for CO, and 3.0 gm/mi for NOx
*** The 1975 Standards are 1.5 gm/mi HC, 15 gm/mi CO, 3.1 gm/mi for passenger cars and 2.0 gm/mi HC, 20.0 gm/mi CO, 3.1 gm/mi for light duty trucks

Table 23
FY75 Emission Factor Program
Emission Results for Los Angles

Percent Meeting California Standards

	1972 FTP Test Data Passed 1972* Standards		1972 FTP Test Data Passed 1973* Standards		1972 FTP Test Data Passed 1974* Standards		1975 FTP Test Data Passed 1975* Standards	
Year	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1970	0	0.0	0	0.0	0	0.0	0	0.0
1971	0	0.0	0	0.0	0	0.0	0	0.0
1972	5	20.0	5	20.0	1	4.0	0	0.0
1973	5	18.5	3	11.1	0	0.0	0	0.0
1974	5	18.5	5	18.5	5	18.5	0	0.0
1975	24	85.7	24	85.7	19	67.9	10	35.7
1976	30	88.2	30	88.2	29	85.3	24	70.6
LDT	12	70.6	12	70.6	10	58.8	9	52.9

* The 1972 Standards are 3.2 gm/mi for HC, 39 gm/mi for CO and 3.2 gm/mi for NOx
The 1973 Standards are 3.2 for HC, 39 for CO and 3.0 for NOx
The 1974 Standards are 3.2 for HC, 39 for CO and 2.0 for NOx
The 1975 Standards are 0.9 for HC, 9.0 for CO and 2.0 for NOx

TABLE 24
COMPARISON OF MEAN EMISSION LEVELS OF NEW VEHICLES* IN THE FY 71, FY 72, FY 73, FY 74, AND FY 75 EMISSION FACTOR PROGRAMS

1975 FTP (gm/mi)

		COMPOSITE			DENVER			LOS ANGELES		
MODEL	YEAR	SAMPLE SIZE	MEAN	S.D.	SAMPLE SIZE	MEAN	S.D.	SAMPLE SIZE	MEAN	S.D.
HC	1971	80	3.07	1.36	20	5.59	1.42	21	3.02	0.79
	1972	140	3.02	2.22	35	4.75	2.42	35	3.56	4.24
	1973	140	3.59	1.61	35	4.54	1.79	35	3.85	4.24
	1974	193	3.58	2.37	30	5.15	2.74	30	2.57	1.38
	1975	587	1.32	1.03	35	2.22	1.12	35	0.52	0.26
	1976	515	1.34	0.99	34	2.34	1.23	34	0.72	0.40
CO	1971	80	39.56	25.62	20	88.13	35.96	21	42.26	19.91
	1972	140	36.88	24.04	35	80.36	32.46	35	46.68	24.06
	1973	140	46.96	32.90	35	84.70	41.27	35	39.39	32.72
	1974	193	41.77	25.69	30	83.67	38.54	30	37.05	28.14
	1975	587	22.92	23.56	35	48.52	28.46	35	6.59	6.87
	1976	515	18.30	19.03	34	45.09	25.40	34	7.95	8.12
NOX	1971	80	5.06	1.84	20	3.05	1.59	21	3.83	1.10
	1972	140	4.55	1.59	35	3.08	1.39	35	3.81	1.21
	1973	140	3.47	1.63	35	1.96	0.87	35	3.04	1.13
	1974	193	2.89	1.40	30	1.85	0.84	30	2.47	1.49
	1975	587	2.44	1.01	35	1.62	0.65	35	2.38	1.14
	1976	515	2.56	1.12	34	1.82	0.72	34	1.57	0.64

*Vehicles tested in approximately their first year of operation.

TABLE 2 5

1975 FTP MEAN EMISSION LEVELS BY MODEL YEAR FOR
FY 71, FY 72, FY 73, FY 74, and FY 75
COMPOSITE OF ALL CITIES EXCEPT LOS ANGELES AND DENVER

Emission in GM/MI, Fuel Economy in MPG
Average Mileage in Thousands

Year		1971 Program Mean	1971 Program S.D.	1972 Program Mean	1972 Program S.D.	1973 Program Mean	1973 Program S.D.	1974 Program Mean	1974 Program S.D.	1975 Program Mean	1975 Program S.D.
65-67	N	458	-	140	-	68	-	126	-	75	-
	Ave. Mi.	68.5	-	69.3	-	68.1	-	80.8	-	87.0	-
	HC	8.74	7.63	8.67	6.97	8.65	5.84	8.93	7.51	8.85	7.19
	CO	86.5	40.3	93.48	40.18	108.28	53.09	108.54	52.31	110.10	59.98
	NOX	3.54	1.91	3.34	1.65	4.04	1.84	2.89	1.44	2.83	1.41
	MPG	14.2	2.8	14.40	2.66	12.57	2.67	13.71	2.83	13.77	3.38
1968	N	69	-	84	-	72	-	77	-	74	-
	Ave. Mi.	48.5	-	57.9	-	61.0	-	69.5	-	83.0	-
	HC	5.73	7.80	6.18	5.01	7.09	8.59	6.30	6.72	6.37	4.61
	CO	69.33	61.37	64.60	34.94	74.75	44.63	82.59	44.76	87.07	51.53
	NOX	4.44	1.89	4.32	1.71	5.21	2.48	3.60	1.78	3.49	1.85
	MPG	13.6	3.3	14.37	2.63	12.95	2.85	13.60	2.63	13.40	2.19
1969	N	72	-	88	-	84	-	88	-	90	-
	Ave. Mi.	39.9	-	51.2	-	57.8	-	62.5	-	77.1	-
	HC	5.25	4.72	4.83	2.53	6.30	5.77	5.98	3.64	5.77	4.91
	CO	59.99	32.57	62.38	34.18	67.69	34.29	78.46	38.51	70.04	40.79
	NOX	5.45	2.02	5.08	1.93	5.56	2.16	4.25	1.71	4.13	1.75
	MPG	13.7	2.9	14.28	2.59	13.22	2.37	13.66	2.47	14.19	2.76

TABLE 25

Emissions in GM/MI, Fuel Economy in MPG
Average Mileage in Thousands

Year		1971 Program Mean	1971 Program S.D.	1972 Program Mean	1972 Program S.D.	1973 Program Mean	1973 Program S.D.	1974 Program Mean	1974 Program S.D.	1975 Program Mean	1975 Program S.D.
1970	N	70	-	108	-	88	-	99	-	104	-
	Ave. Mi.	29.5	-	36.8	-	51.4	-	58.8	-	66.3	-
	HC	3.77	1.83	4.89	4.21	5.07	3.17	5.34	7.67	5.78	4.36
	CO	47.55	24.41	53.23	36.87	65.02	26.91	63.88	31.83	74.98	52.45
	NOX	5.15	1.67	4.35	1.67	4.95	2.08	3.66	1.33	3.50	1.34
	MPG	13.7	3.5	14.55	3.48	12.68	2.62	13.86	2.89	13.82	3.07
1971	N	80	-	120	-	108	-	113	-	120	-
	Ave. Mi.	15.6	-	26.4	-	37.4	-	48.5	--	68.7	-
	HC	3.07	1.36	3.94	2.22	4.22	2.39	5.21	6.20	4.84	4.89
	CO	39.56	25.62	51.13	37.02	51.53	35.29	52.69	37.55	56.12	34.21
	NOX	5.06	1.84	4.30	1.58	4.83	2.01	3.90	1.33	3.84	1.47
	MPG	13.3	4.4	14.48	4.14	12.93	3.45	13.58	3.52	13.81	3.37
1972	N			140	-	120	-	176	-	135	-
	Ave. Mi.			14.8	-	28.7	-	41.9	-	52.2	-
	HC			3.02	2.22	4.17	3.85	4.23	4.50	3.82	2.25
	CO			36.88	24.04	56.74	42.60	51.79	48.71	50.61	30.29
	NOX			4.55	1.59	4.80	2.09	4.03	1.48	4.03	1.57
	MPG			13.54	3.40	12.85	3.34	13.40	3.75	13.81	3.51
1973	N					140	-	128	-	204	-
	Ave. Mi.					18.1	-	29.0	-	43.2	-
	HC					3.59	1.61	3.33	1.78	3.65	3.18
	CO					46.96	32.90	45.31	40.42	49.12	29.86
	NOX					3.47	1.63	3.01	1.62	2.97	1.21
	MPG					12.58	3.20	13.02	3.43	13.07	3.43
1974	N					40	-	193	-	204	-
	Ave. Mi.					5.8	-	20.2	-	31.7	-
	HC					3.08	1.22	3.58	2.37	3.97	3.17
	CO					35.92	24.20	41.77	25.69	52.19	37.35
	NOX					2.90	1.19	2.89	1.40	2.90	1.35
	MPG					11.39	2.46	12.77	3.33	13.18	3.52

TABLE 25

Emissions in GM/MI, Fuel Economy in MPG
Average Mileage in Thousands

Year		1971 Program Mean	1971 Program S.D.	1972 Program Mean	1972 Program S.D.	1973 Program Mean	1973 Program S.D.	1974 Program Mean	1974 Program S.D.	1975 Program Mean	1975 Program S.D.
1975	N							587	-	203	-
	Ave. Mi.							8.8	-	22.4	-
	HC							1.32	1.03	1.34	0.99
	CO							22.92	23.56	18.30	19.03
	NOX							2.44	1.01	2.56	1.12
	MPG							13.51	3.31	13.86	3.60

TABLE 26

Change in Emission and Urban Fuel Economy for Vehicles in both EF 74 and EF 75 Programs from all cities except Denver and Los Angeles
1975 FTP

Model Year	N	Mileage FY74 Mean	Mileage FY75 Mean	(K) Mean* Increase*	HC gm/mi FY74 Mean	HC gm/mi FY75 Mean	HC gm/mi DM*	HC gm/mi Mean CPTM*	CO gm/mi FY74 Mean	CO gm/mi FY75 Mean	CO gm/mi DM*	CO gm/mi Mean CPTM*	NOx gm/mi FY74 Mean	NOx gm/mi FY75 Mean	NOx gm/mi DM*	NOx gm/mi Mean CPTM*	Fuel Economy mi/gal FY74 Mean	Fuel Economy mi/gal FY75 Mean	Fuel Economy mi/gal DM*	Fuel Economy mi/gal Mean Year CPTM
1966-1968	55	69	80	10	6.78	7.39	.06	.05	96.1	100.4	.39	.73	3.53	3.05	-.04	-.09	13.3	13.4	.01	.04
1969	21	55	66	11	5.83	4.66	-.11	-.11	76.3	61.6	-1.3	-1.3	4.61	4.65	.00	-.06	14.1	14.7	.07	.05
1970	39	53	62	9	4.31	6.36	.23	190	59.5	70.7	1.2	387.	4.00	3.56	.05	-16.8	13.9	13.8	-.01	-4.09
1971	43	47	57	10	3.83	4.28	.05	.03	44.3	47.9	.36	.14	4.10	4.03	.01	-.02	14.2	14.2	.0	.01
1972	44	38	47	9	4.17	3.45	-.08	-.09	48.1	46.1	-.22	-.72	3.87	3.87	.0	-.01	13.7	13.9	.02	.09
1973	52	29	40	11	3.31	3.44	.01	.04	46.3	41.7	-.42	-.89	2.91	2.91	.0	-.16	12.7	13.2	.05	.09
1974	73	9	12	5	1.39	4.16	.92	.98	25.0	32.9	2.6	3.71	1.38	1.55	.06	.26	13.1	13.5	.13	.05
1975	115	8	21	14	1.32	1.62	.02	.03	22.4	24.7	.18	.17	2.54	2.65	.01	.26	13.6	14.1	.04	.07

*DM Deterioration of the mean, i.e., (FY75 mean outcome - FY74 mean outcome) / (FY75 mean mileage (K) - FY74 Mean Mileage (K). CPTM: Change per thousand miles. Mean Increase: Average of the per car mileage increases.

Table 27

FY75 Emission Factor Program

Emission Results for All Cities Except Los Angeles and Denver by Model Year and Inertia Weight 1975 FTP

INERTIA WT. (LBS.)	66-8		1969		1970		1971		1972		1973		1974		1975		1976		LDT*	
	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
<2001	N= 1		N= 4		N= 5		N= 4		N= 3		N= 3		N= 0		N= 9		N= 16		N= 0	
HC	8.27	0.0	5.31	2.92	3.39	0.09	11.94	14.95	4.01	1.92	4.24	2.54	0.0	0.0	1.57	1.55	1.10	0.99	0.0	0.0
CO	128.09	0.0	59.82	27.10	41.69	15.17	77.65	37.06	50.80	33.32	48.14	15.62	0.0	0.0	18.14	19.51	17.05	22.72	0.0	0.0
NOX	1.91	0.0	2.18	1.00	2.55	0.61	1.19	0.58	2.29	0.40	2.43	0.66	0.0	0.0	1.83	0.62	1.87	0.51	0.0	0.0
FUEL ECONOMY	0.05	0.0	22.47	1.52	24.17	1.92	20.44	2.29	24.10	4.26	20.95	1.94	0.0	0.0	23.66	2.99	22.97	2.26	0.0	0.0
2001-2500	N= 3		N= 3		N= 6		N= 14		N= 21		N= 35		N= 22		N= 15		N= 51		N= 1	
HC	5.86	2.67	3.41	1.24	7.04	10.65	3.72	0.69	3.44	1.46	3.85	1.83	3.06	0.62	1.56	0.66	1.33	0.67	1.37	0.0
CO	70.63	26.98	48.86	29.32	40.83	27.78	49.87	19.02	37.79	18.52	50.61	37.27	32.29	10.66	15.22	7.67	15.71	8.60	18.20	0.0
NOX	1.81	0.74	6.09	3.70	4.07	1.19	3.13	1.74	3.57	1.53	2.26	1.04	2.76	0.78	2.27	0.79	2.64	0.77	4.36	0.0
FUEL ECONOMY	23.55	0.70	19.24	2.93	22.78	2.89	22.49	2.01	21.79	1.69	20.36	3.22	23.18	1.94	22.61	3.02	23.04	2.39	0.05	0.0
2501-3000	N= 23		N= 13		N= 14		N= 13		N= 17		N= 26		N= 38		N= 35		N= 73		N= 3	
HC	5.62	2.37	8.32	10.81	4.57	3.82	3.94	1.50	3.20	0.88	3.03	1.29	3.80	3.39	1.79	2.08	1.26	1.02	1.15	0.29
CO	74.70	36.61	54.55	28.83	47.54	30.42	65.42	38.31	47.00	23.09	43.51	24.73	47.83	29.14	22.75	19.16	17.15	17.43	12.60	2.87
NOX	3.04	1.59	3.51	1.08	3.50	1.24	4.55	1.55	3.56	1.65	3.17	1.18	2.45	0.99	2.42	1.18	2.13	0.81	2.01	1.03
FUEL ECONOMY	17.76	2.37	18.13	2.79	16.04	3.21	16.60	2.69	18.45	1.90	17.02	3.07	17.77	2.74	17.53	2.75	18.43	2.03	18.03	2.13
3001-3500	N= 37		N= 22		N= 22		N= 33		N= 25		N= 21		N= 28		N= 32		N= 99		N= 6	
HC	7.27	5.38	5.27	1.84	6.34	3.86	4.08	1.65	3.46	1.04	3.03	1.02	4.20	2.63	1.54	1.07	1.41	1.07	1.29	0.83
CO	88.47	61.06	64.01	32.27	95.00	71.70	45.18	22.35	40.63	22.45	46.15	25.20	48.27	23.91	23.27	20.81	14.00	14.62	22.10	11.66
NOX	3.29	1.72	4.46	1.64	2.96	1.29	3.66	1.31	3.95	1.51	2.35	0.80	3.13	1.95	2.74	1.44	2.74	1.23	2.24	0.51
FUEL ECONOMY	14.33	2.10	14.58	1.44	14.00	2.28	14.43	1.31	13.86	1.62	12.99	1.54	13.72	2.85	14.74	2.10	15.81	1.74	13.35	2.22
3501-4000	N= 52		N= 29		N= 36		N= 24		N= 19		N= 49		N= 44		N= 37		N=121		N= 43	
HC	7.61	5.90	5.74	3.92	6.37	4.53	4.52	3.34	3.71	1.16	4.06	4.50	4.24	4.76	1.34	0.88	1.53	1.14	1.49	1.44
CO	98.19	45.18	70.80	30.90	75.93	36.67	49.36	22.94	58.96	26.05	50.10	32.51	49.00	37.99	22.46	19.58	24.23	24.57	22.24	28.38
NOX	3.23	1.60	4.16	1.57	3.54	1.30	3.85	1.00	3.87	1.18	2.97	1.06	2.86	1.41	2.93	1.39	2.64	1.26	2.36	0.79
FUEL ECONOMY	13.17	1.70	13.42	1.42	13.09	1.34	13.03	1.43	12.62	0.92	12.10	1.42	12.28	1.07	13.42	1.32	14.17	1.31	12.62	1.48
4001-4500	N= 26		N= 15		N= 17		N= 25		N= 34		N= 41		N= 42		N= 47		N= 93		N= 11	
HC	9.48	9.62	5.52	2.30	5.29	1.82	6.66	7.72	4.80	3.44	4.09	4.44	4.25	2.68	1.84	1.33	1.27	0.93	2.70	2.69
CO	109.22	49.39	98.32	67.92	81.17	27.11	71.67	51.12	66.99	41.36	53.02	27.30	61.16	44.64	28.37	26.36	19.26	19.95	43.44	37.43
NOX	3.40	1.99	4.14	2.02	4.16	1.27	4.28	1.27	4.48	1.64	3.46	1.00	3.14	1.24	2.65	1.11	2.77	1.15	2.85	1.12
FUEL ECONOMY	11.56	1.23	11.89	1.27	11.74	0.95	11.02	1.39	11.43	0.99	11.49	1.10	11.22	1.03	11.69	1.17	12.63	0.85	13.03	1.33
4501-5000	N= 4		N= 4		N= 4		N= 5		N= 13		N= 26		N= 21		N= 13		N= 39		N= 0	
HC	9.08	3.79	3.61	2.10	4.84	3.35	3.16	1.54	3.88	3.14	3.12	1.33	3.53	1.56	1.41	0.84	1.02	0.64	0.0	0.0
CO	187.79	90.53	68.13	33.05	118.80	140.83	67.75	38.02	45.59	21.63	48.85	28.97	60.00	44.96	24.11	14.81	15.71	15.52	0.0	0.0
NOX	2.59	1.15	4.63	1.82	3.59	2.34	4.11	1.53	4.74	1.64	3.35	1.53	3.24	1.79	2.41	0.79	2.54	1.17	0.0	0.0
FUEL ECONOMY	10.30	1.30	11.15	1.24	9.77	1.13	10.49	0.98	10.80	1.10	9.74	1.24	9.98	1.26	11.02	1.18	11.41	0.77	0.0	0.0
>5000	N= 3		N= 0		N= 0		N= 2		N= 3		N= 3		N= 9		N= 15		N= 23		N= 6	
HC	10.45	5.60	0.0	0.0	0.0	0.0	2.10	0.20	1.99	0.76	2.18	0.51	4.59	2.97	3.06	2.49	1.26	0.85	0.0	0.0
CO	223.99	107.00	0.0	0.0	0.0	0.0	34.68	5.33	26.88	12.44	35.06	26.78	86.83	54.80	77.07	108.84	16.26	17.47	0.0	0.0
NOX	1.66	0.44	0.0	0.0	0.0	0.0	5.82	2.36	5.33	0.46	4.73	2.08	2.78	1.03	2.63	1.65	2.28	0.92	0.0	0.0
FUEL ECONOMY	9.15	1.36	0.0	0.0	0.0	0.0	9.25	0.98	10.59	1.88	9.59	0.75	9.73	0.48	10.14	2.15	10.70	0.70	0.0	0.0
TOTAL	N=149		N= 90		N=104		N=120		N=135		N=204		N=204		N=203		N=515		N= 64	
HC	7.62	6.16	5.77	4.91	5.78	4.34	4.84	4.89	3.82	2.25	3.65	3.18	3.97	3.17	1.72	1.49	1.34	0.99	1.66	1.54
CO	98.66	56.94	70.04	40.74	74.98	52.45	56.12	34.21	50.61	30.29	49.12	29.86	52.19	37.35	27.42	37.65	18.30	19.03	25.36	29.05
NOX	3.16	1.67	4.13	1.75	3.50	1.34	3.84	1.47	4.03	1.57	2.97	1.21	2.90	1.38	2.59	1.24	2.56	1.12	2.45	0.88
FUEL ECONOMY	13.59	2.82	14.19	2.76	13.83	3.06	13.81	3.38	13.80	3.50	13.07	3.43	13.18	3.52	13.86	3.60	14.88	3.34	13.00	1.81

Table 28
FY75 Emission Factor Program
Fuel Economy Results for Chicago

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	12.42	2.47	14.09	2.62	15.73	2.88	13.24	2.47	14.10	2.58
1969	30	12.94	2.25	14.44	2.41	16.08	2.29	13.68	2.25	14.50	2.27
1970	35	12.58	3.06	14.06	3.30	15.81	3.98	13.31	3.13	14.15	3.35
1971	40	12.79	3.40	13.94	3.42	16.13	3.70	13.37	3.32	14.21	3.42
1972	45	12.88	3.26	13.81	3.76	15.93	3.83	13.35	3.47	14.11	3.64
1973	50	12.46	3.32	13.14	3.49	15.14	4.02	12.80	3.38	13.47	3.55
1974	50	12.33	3.69	13.02	3.91	14.85	4.14	12.68	3.73	13.32	3.87
1975	50	13.15	3.33	13.83	3.48	15.57	3.97	13.50	3.38	14.11	3.53
1976	150	13.83	3.21	14.88	3.37	16.36	3.80	14.35	3.26	15.01	3.42
LDT*	17	12.17	1.56	12.67	1.83	14.23	1.76	12.42	1.62	12.95	1.71

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 29
FY75 Emission Factor Program
Fuel Economy Results for Denver

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	13.50	2.89	15.03	3.00	16.54	3.27	14.25	2.87	15.05	2.98
1971	22	12.22	3.45	13.53	3.83	15.49	4.10	12.87	3.61	13.70	3.79
1972	25	13.45	3.51	14.35	3.64	16.14	3.98	13.91	3.54	14.59	3.67
1973	27	13.02	3.55	13.79	3.81	15.43	4.21	13.41	3.66	14.02	3.83
1974	27	13.63	3.34	14.24	3.39	15.72	3.81	13.94	3.32	14.48	3.45
1975	28	13.37	3.40	14.52	3.38	15.76	4.01	13.95	3.38	14.58	3.52
1976	34	13.85	3.26	15.21	3.33	16.35	3.76	14.53	3.28	15.19	3.40
LDT*	17	12.57	1.87	13.35	2.09	14.64	2.22	12.97	1.94	13.50	2.04

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 30
FY75 Emission Factor Program
Fuel Economy Results for Houston

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	11.82	3.57	12.42	3.86	14.34	4.36	12.13	3.66	12.75	3.87
1974	27	11.63	3.32	12.12	3.36	13.96	3.66	11.88	3.30	12.46	3.39
1975	28	12.45	3.24	12.84	3.49	14.73	3.93	12.65	3.34	13.22	3.52
1976	34	13.09	2.82	14.19	3.38	15.68	3.57	13.65	3.06	14.32	3.27
LDT*	17	12.33	2.11	12.78	2.09	14.37	2.24	12.56	2.06	13.08	2.10

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 31
FY75 Emission Factor Program
Fuel Economy Results for Los Angeles

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	13.51	3.55	14.39	3.39	16.96	3.86	13.96	3.39	14.80	3.47
1971	22	11.95	3.80	12.64	4.24	14.47	4.56	12.30	3.98	13.02	4.18
1972	25	11.89	3.53	12.66	3.60	14.72	4.08	12.28	3.53	12.98	3.65
1973	27	12.12	3.66	12.71	3.86	14.73	4.36	12.42	3.74	13.07	3.92
1974	27	11.42	3.13	12.20	3.28	13.91	3.62	11.81	3.15	12.44	3.29
1975	28	11.81	3.53	12.98	3.81	14.33	4.31	12.39	3.62	13.05	3.83
1976	34	12.75	3.13	13.85	3.27	15.54	3.95	13.30	3.15	14.02	3.34
LDT*	17	12.65	1.97	12.92	1.98	14.91	2.16	12.79	1.87	13.35	1.94

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 32
FY75 Emission Factor Program
Fuel Economy Results for St. Louis

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	11.71	2.79	12.86	3.01	14.91	3.17	12.28	2.82	13.09	2.90
1969	30	12.56	2.69	13.14	2.46	15.78	2.81	12.86	2.45	13.63	2.48
1970	34	12.17	2.88	12.96	3.05	15.81	3.24	12.57	2.63	13.44	2.73
1971	40	12.47	3.27	13.06	3.19	15.40	3.46	12.77	3.17	13.49	3.23
1972	45	12.67	3.28	13.24	3.44	15.52	3.72	12.96	3.31	13.66	3.44
1973	50	11.94	3.06	12.41	3.04	14.76	3.61	12.18	3.00	12.87	3.14
1974	50	12.18	3.25	12.71	3.35	14.83	3.69	12.45	3.27	13.11	3.39
1975	48	12.65	3.62	13.06	3.66	14.89	4.38	12.86	3.61	13.42	3.80
1976	146	13.70	3.03	14.40	3.27	16.26	3.77	14.06	3.12	14.70	3.30
LDT*	13	11.67	1.58	12.51	1.64	13.80	1.67	12.10	1.55	12.65	1.58

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 33
FY75 Emission Factor Program
Fuel Economy Results for Washington

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	11.97	3.37	12.27	3.12	14.61	3.70	12.12	3.16	12.76	3.24
1974	27	12.62	3.40	13.09	3.71	15.33	3.94	12.86	3.53	13.52	3.68
1975	28	12.92	3.10	13.62	3.23	15.45	3.63	13.28	3.13	13.92	3.28
1976	34	13.83	2.99	14.89	3.29	16.57	3.59	14.36	3.10	15.07	3.25
LDT*	17	12.21	1.49	13.13	2.56	14.56	1.69	12.67	1.83	13.28	1.93

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 34
FY75 Emission Factor Program
Fuel Economy Results for Phoenix

		FUEL ECONOMY IN MILES PER GALLON									
		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	49	12.27	2.86	13.44	2.84	15.21	3.18	12.85	2.77	13.61	2.87
1969	30	12.77	3.18	14.35	3.63	16.40	3.56	13.55	3.31	14.47	3.45
1970	35	12.52	3.57	13.62	3.15	15.83	3.41	13.07	3.18	13.90	3.17
1971	40	12.47	3.41	13.55	3.43	15.44	3.83	13.01	3.41	13.77	3.51
1972	45	12.45	3.23	13.35	3.49	15.45	3.90	12.91	3.32	13.65	3.50
1973	50	12.11	3.53	12.92	3.57	14.99	3.93	12.52	3.38	13.23	3.51
1974	50	12.23	3.32	13.03	3.33	15.02	3.72	12.63	3.25	13.33	3.37
1975	49	13.10	3.44	14.31	3.76	15.89	3.93	13.71	3.52	14.43	3.67
1976	151	13.77	3.08	14.92	3.36	16.35	3.71	14.35	3.19	15.02	3.36
LDT*	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 35
FY75 Emission Factor Program
Fuel Economy Results for All Cities but Los Angeles and Denver

FUEL ECONOMY IN MILES PER GALLON

		COLD TRANSIENT		COLD STABILIZED		HOT TRANSIENT		1972 FTP		1975 FTP	
YEAR	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	149	12.13	2.72	13.44	2.89	15.28	3.10	12.78	2.73	13.59	2.82
1969	90	12.75	2.71	13.95	2.89	16.08	2.89	13.35	2.70	14.19	2.76
1970	104	12.42	3.15	13.54	3.17	15.82	3.53	12.98	2.96	13.82	3.07
1971	120	12.58	3.34	13.51	3.34	15.65	3.65	13.05	3.28	13.81	3.37
1972	135	12.67	3.24	13.46	3.54	15.63	3.80	13.07	3.35	13.81	3.51
1973	204	12.09	3.33	12.69	3.39	14.83	3.88	12.40	3.28	13.07	3.43
1974	204	12.21	3.38	12.83	3.52	14.82	3.82	12.53	3.40	13.18	3.52
1975	203	12.89	3.37	13.58	3.58	15.34	4.02	13.24	3.43	13.86	3.60
1976	515	13.72	3.07	14.70	3.34	16.29	3.73	14.22	3.17	14.88	3.34
LDT*	64	12.12	1.68	12.78	2.02	14.26	1.84	12.46	1.75	13.00	1.82

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Table 36
FY75 Emission Factor Program
Highway Fuel Economy Test for Chicago

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	0.32	0.32	0.32
		SD	0.27	0.38	0.30
	GEOMETRIC	MEAN	0.24	0.18	0.22
		SD	2.30	3.11	2.47
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	3.10	4.35	3.38
		SD	3.95	6.91	4.72
	GEOMETRIC	MEAN	1.40	1.51	1.42
		SD	4.51	5.14	4.56
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	407.57	476.41	423.22
		SD	102.59	61.23	98.55
	GEOMETRIC	MEAN	393.74	472.60	410.42
		SD	1.32	1.15	1.30
NOX (GM/MI)	ARITHMETIC	MEAN	2.92	2.75	2.88
		SD	1.12	0.94	1.08
	GEOMETRIC	MEAN	2.72	2.58	2.69
		SD	1.46	1.49	1.46
FUEL ECONOMY (MPG)		MEAN	21.47	18.33	20.66
		SD	5.28	2.26	4.71

Table 37
FY75 Emission Factor Program
Highway Fuel Economy test for Denver

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	1.09	1.07	1.08
		SD	0.78	0.90	0.80
	GEOMETRIC	MEAN	0.81	0.76	0.80
		SD	2.32	2.44	2.32
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	26.84	30.59	27.69
		SD	19.96	26.54	21.35
	GEOMETRIC	MEAN	16.10	20.45	17.00
		SD	3.82	2.83	3.56
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	387.91	426.54	396.69
		SD	99.34	116.44	103.34
	GEOMETRIC	MEAN	374.09	412.52	382.49
		SD	1.33	1.32	1.32
NOX (GM/MI)	ARITHMETIC	MEAN	2.23	2.35	2.26
		SD	1.11	1.23	1.12
	GEOMETRIC	MEAN	1.98	2.14	2.01
		SD	1.66	1.53	1.62
FUEL ECONOMY (MPG)		MEAN	20.47	18.57	20.01
		SD	4.76	3.98	4.59

Table 38
FY75 Emission Factor Program
Highway Fuel Economy test for Houston

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	0.50	0.55	0.51
		SD	0.49	0.52	0.49
	GEOMETRIC	MEAN	0.33	0.41	0.35
		SD	2.59	2.16	2.49
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	3.15	6.02	3.80
		SD	3.89	7.85	5.10
	GEOMETRIC	MEAN	1.35	2.66	1.58
		SD	4.42	4.32	4.45
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	427.88	433.20	429.09
		SD	96.20	65.66	89.50
	GEOMETRIC	MEAN	415.74	428.20	418.53
		SD	1.29	1.18	1.27
NOX (GM/MI)	ARITHMETIC	MEAN	3.07	3.81	3.24
		SD	1.32	1.57	1.40
	GEOMETRIC	MEAN	2.84	3.50	2.98
		SD	1.48	1.56	1.50
FUEL ECONOMY (MPG)		MEAN	20.43	19.97	20.33
		SD	4.42	3.10	4.11

Table 39
FY75 Emission Factor Program
Highway Fuel Economy test for Los Angeles

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	0.14	0.26	0.17
		SD	0.14	0.50	0.26
	GEOMETRIC	MEAN	0.11	0.12	0.11
		SD	1.94	3.01	2.16
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	1.26	4.00	1.84
		SD	3.63	10.26	5.79
	GEOMETRIC	MEAN	0.08	0.81	0.13
		SD	186.09	4.92	114.33
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	451.37	447.32	450.45
		SD	113.09	43.82	101.10
	GEOMETRIC	MEAN	435.61	445.31	437.79
		SD	1.33	1.11	1.29
NOX (GM/MI)	ARITHMETIC	MEAN	1.97	2.50	2.09
		SD	0.69	1.49	0.94
	GEOMETRIC	MEAN	1.87	2.13	1.92
		SD	1.38	1.86	1.50
FUEL ECONOMY (MPG)		MEAN	19.56	19.53	19.55
		SD	4.84	2.23	4.36

Table 40
FY75 Emission Factor Program
Highway Fuel Economy Test for St. Louis

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	0.55	0.77	0.59
		SD	0.56	0.95	0.64
	GEOMETRIC	MEAN	0.37	0.48	0.39
		SD	2.54	2.72	2.55
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	5.25	13.92	6.77
		SD	12.13	17.04	13.29
	GEOMETRIC	MEAN	1.85	7.98	2.39
		SD	4.36	3.21	4.56
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	415.29	471.93	425.20
		SD	107.76	64.63	103.18
	GEOMETRIC	MEAN	399.96	467.82	411.08
		SD	1.34	1.16	1.32
NOX (GM/MI)	ARITHMETIC	MEAN	3.06	3.66	3.16
		SD	1.68	1.58	1.66
	GEOMETRIC	MEAN	2.60	3.39	2.73
		SD	1.85	1.53	1.81
FUEL ECONOMY (MPG)		MEAN	20.87	17.88	20.28
		SD	4.94	2.65	4.61

Table 41
FY75 Emission Factor Program
Highway Fuel Economy Test for Washington

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	0.23	0.32	0.25
		SD	0.21	0.39	0.26
	GEOMETRIC	MEAN	0.17	0.17	0.17
		SD	2.19	3.38	2.43
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	1.88	2.81	2.09
		SD	3.10	3.44	3.16
	GEOMETRIC	MEAN	0.70	1.09	0.77
		SD	4.61	5.13	4.69
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	410.74	461.09	422.19
		SD	96.35	67.56	92.39
	GEOMETRIC	MEAN	398.87	455.75	411.14
		SD	1.29	1.18	1.27
NOX (GM/MI)	ARITHMETIC	MEAN	2.96	2.66	2.89
		SD	1.34	1.01	1.26
	GEOMETRIC	MEAN	2.69	2.50	2.65
		SD	1.56	1.43	1.53
FUEL ECONOMY (MPG)		MEAN	21.42	19.02	20.82
		SD	4.95	2.63	4.48

Table 42
FY75 Emission Factor Program
Highway Fuel Economy Test for all Cities
Except Los Angeles and Denver

			1976	1976 LDT	TOTAL
HYDROCARBONS (GM/MI)	ARITHMETIC	MEAN	0.40	0.47	0.41
		SD	0.42	0.57	0.46
	GEOMETRIC	MEAN	0.26	0.27	0.26
		SD	2.51	3.04	2.62
CARBON MONOXIDE (GM/MI)	ARITHMETIC	MEAN	3.33	6.20	3.95
		SD	6.82	9.72	7.60
	GEOMETRIC	MEAN	1.25	2.21	1.41
		SD	4.59	5.03	4.75
CARBON DIOXIDE (GM/MI)	ARITHMETIC	MEAN	415.37	459.74	424.92
		SD	99.95	64.45	95.07
	GEOMETRIC	MEAN	402.01	454.80	412.82
		SD	1.30	1.17	1.29
NOX (GM/MI)	ARITHMETIC	MEAN	3.00	3.18	3.04
		SD	1.36	1.34	1.36
	GEOMETRIC	MEAN	2.71	2.93	2.76
		SD	1.59	1.52	1.57
FUEL ECONOMY (MPG)		MEAN	21.04	18.85	20.52
		SD	4.85	2.65	4.44

TABLE 43

COMPARISON OF HIGHWAY FUEL ECONOMY
WITH 1975 FTP FUEL ECONOMY
1976 Model Year Passenger Cars and Light Duty Trucks

Location	N	Average Highway Fuel Economy	Average 1975 FTP Fuel Economy	Ratio
Chicago	44	20.66	14.7	1.40
Houston	44	20.32	14.24	1.43
St. Louis	40	20.28	14.71	1.38
Washington	44	20.82	14.70	1.42
5 City Composite	172	20.52	14.59	1.41
Denver	44	20.01	14.84	1.35
Los Angeles	44	19.55	14.00	1.40

Table 44
FY75 Emission Factor Program
Emission Results for all Cities except Los Angeles and Denver
Results of 1975 FTP for 1976 Model year Vehicles Presented by Manufacturer

			HYDROCARBONS (GM/MI)				CARBON MONOXIDE (GM/MI)				OXIDES OF NITROGEN (GM/MI)				% BELOW FED STND		
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC				
MANUFACTURER	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	HC	CO	NOX
GEN.MOTORS	229	12.5	1.33	1.07	1.04	2.01	21.06	21.78	12.80	2.82	2.52	1.00	2.36	1.43	69	57	81
FORD	120	10.8	1.04	0.69	0.91	1.62	9.17	11.58	5.66	2.58	2.40	1.01	2.23	1.47	88	87	84
CHRYSLER	65	10.7	2.14	1.23	1.83	1.79	29.83	20.52	23.05	2.14	3.08	1.68	2.77	1.55	41	30	72
AMER. MOTORS	17	12.4	1.08	0.49	0.98	1.62	15.58	12.24	12.11	2.03	3.19	1.44	2.90	1.59	88	64	52
OTHERS	84	10.3	1.20	0.61	1.03	1.83	15.41	11.77	12.27	2.11	2.37	0.77	2.24	1.45	78	59	85
TOTAL	515	11.5	1.34	0.99	1.08	1.91	18.30	19.03	11.30	2.78	2.56	1.12	2.37	1.47	72	61	80

Table 45
FY75 Emission Factor Program
Emission Results for Denver
Results of 1975 FTP for 1976 Model year Vehicles Presented by Manufacturer

			HYDROCARBONS (GM/MI)				CARBON MONOXIDE (GM/MI)				OXIDES OF NITROGEN (GM/MI)				% BELOW FED STND		
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC				
MANUFACTURER	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	HC	CO	NOX
GEN.MOTORS	15	13.8	2.78	1.02	2.61	1.43	56.40	23.43	52.75	1.44	1.91	0.75	1.79	1.41	6	0	93
FORD	8	8.4	1.06	0.14	1.06	1.14	17.66	10.58	15.02	1.85	1.35	0.50	1.27	1.46	100	62	100
CHRYSLER	4	7.7	3.92	1.49	3.64	1.63	69.44	16.91	67.71	1.31	2.30	0.69	2.23	1.33	0	0	75
AMER. MOTORS	1	7.7	2.14	0.0	2.14	0.0	56.52	0.0	56.52	0.0	1.41	0.0	1.41	0.0	0	0	100
OTHERS	6	9.8	1.93	0.55	1.86	1.34	35.27	13.81	33.29	1.44	1.96	0.78	1.82	1.57	33	0	100
TOTAL	34	10.9	2.34	1.23	2.06	1.68	45.09	25.40	37.34	1.99	1.82	0.72	1.69	1.48	32	14	94

Table 46
FY75 Emission Factor Program
Emission Results for Los Angeles
Results of 1975 FTP for 1976 Model year Vehicles Presented by Manufacturer

			HYDROCARBONS (GM/MI)				CARBON MONOXIDE (GM/MI)				OXIDES OF NITROGEN (GM/MI)				% BELOW		
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		FED STND		
MANUFACTURER	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	HC	CO	NOX
GEN.MOTORS	15	9.8	0.70	0.22	0.67	1.37	6.47	4.23	5.29	1.95	1.62	0.70	1.54	1.34	100	93	93
FORD	8	9.3	0.64	0.28	0.59	1.56	5.59	2.17	5.00	1.80	1.56	0.83	1.43	1.51	100	100	87
CHRYSLER	4	5.2	1.08	0.90	0.87	2.05	10.83	10.05	8.29	2.22	1.54	0.36	1.51	1.24	75	75	100
AMER. MOTORS	1	22.5	0.48	0.0	0.48	0.0	6.77	0.0	6.77	0.0	1.61	0.0	1.61	0.0	100	100	100
OTHERS	6	4.9	0.63	0.44	0.54	1.83	13.09	16.25	8.14	2.72	1.44	0.49	1.35	1.53	100	83	100
TOTAL	34	8.7	0.72	0.40	0.64	1.58	7.95	8.12	5.98	2.05	1.57	0.64	1.48	1.39	97	91	94

Table 47
FY75 Emission Factor Program
Emission Results for All Cities Expect Los Angeles and Denver
Results of 1975 and 1976 Light Duty Trucks Presented by Manufacturer

			HYDROCARBONS (GM/MI)				CARBON MONOXIDE (GM/MI)				OXIDES OF NITROGEN (GM/MI)				% BELOW FED STND		
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC				
MANUFACTURER	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	HC	CO	NOX
GEN.MOTORS	27	14.6	1.85	1.67	1.32	2.29	30.23	30.86	17.96	2.88	2.39	0.74	2.29	1.33	59	55	85
FORD	24	12.8	1.43	1.03	1.14	2.02	18.06	17.73	10.63	3.35	2.37	1.04	2.19	1.51	66	58	83
CHRYSLER	11	13.6	1.82	2.23	1.22	2.32	31.27	43.07	19.09	2.59	2.56	0.74	2.47	1.31	63	45	81
AMER. MOTORS	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
OTHERS	2	4.1	1.09	0.39	1.06	1.44	13.90	6.07	13.23	1.57	3.61	1.06	3.53	1.35	100	50	50
TOTAL	64	13.4	1.66	1.54	1.22	2.14	25.36	29.05	14.77	3.01	2.45	0.88	2.31	1.41	64	54	82

Table 48
FY75 Emission Factor Program
Emission Results for Denver
Results of 1975 FTP for 1975 and 1976 Light Duty Trucks Presented by Manufacturer

			HYDROCARBONS (GM/MI)				CARBON MONOXIDE (GM/MI)				OXIDES OF NITROGEN (GM/MI)				% BELOW FED STND		
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC				
MANUFACTURER	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	HC	CO	NOX
GEN.MOTORS	7	13.7	1.78	0.53	1.72	1.33	32.79	19.55	26.23	2.25	1.68	0.45	1.63	1.32	42	28	100
FORD	6	14.1	1.66	0.91	1.47	1.73	31.22	14.50	26.97	1.96	1.92	1.06	1.70	1.70	66	16	83
CHRYSLER	3	15.8	4.21	0.39	4.20	1.10	73.86	32.73	68.72	1.61	1.61	0.52	1.55	1.39	0	0	100
AMER. MOTORS	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
OTHERS	1	5.2	1.97	0.0	1.97	0.0	38.55	0.0	38.55	0.0	2.34	0.0	2.34	0.0	0	0	100
TOTAL	17	13.7	2.18	1.15	1.92	1.69	39.82	24.69	32.12	2.11	1.79	0.70	1.68	1.45	41	17	94

Table 49
FY75 Emission Factor Program
Emission Results for Los Angeles
Results of 1975 FTP for 1975 and 1976 Light Duty Trucks Presented by Manufacturer

			HYDROCARBONS (GM/MI)				CARBON MONOXIDE (GM/MI)				OXIDES OF NITROGEN (GM/MI)				% BELOW FED STND		
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC				
MANUFACTURER	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	HC	CO	NOX
GEN.MOTORS	7	13.8	0.90	0.46	0.81	1.61	10.04	8.60	7.49	2.26	2.15	1.19	1.88	1.76	85	71	71
FORD	6	14.5	1.60	1.52	1.08	2.61	33.27	44.01	12.46	4.76	1.68	1.39	1.36	1.93	66	66	83
CHRYSLER	3	14.0	1.09	0.16	1.08	1.15	14.65	2.57	14.50	1.19	2.00	0.51	1.96	1.28	100	66	100
AMER. MOTORS	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
OTHERS	1	13.4	0.32	0.0	0.32	0.0	4.89	0.0	4.89	0.0	1.70	0.0	1.70	0.0	100	100	100
TOTAL	17	14.1	1.15	0.98	0.89	1.98	18.75	27.59	9.82	2.89	1.93	1.10	1.68	1.71	82	70	82

Table 50

FY75 Emission Factor Program
Emission Results for 1975 Model Year Vehicles by Response to Question
Concerning Hydrogen Sulfide Odor --- 1975 FTP

		HC GM/MI		CO GM/MI		NOx GM/MI		Idle CO %		Idle HC PPM		Fuel Economy MPG	
Response	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Never	194	1.55	1.38	23.73	35.85	2.32	1.10	1.08	1.77	114	170	14.02	3.08
Rarely	17	1.52	1.75	22.76	28.57	2.78	1.84	0.92	1.79	77	98	13.18	3.60
Occasionally	41	1.82	1.23	32.59	27.19	2.60	1.15	2.15	2.32	160	172	12.84	2.30
Requlary	44	2.06	1.40	36.93	33.65	2.36	1.18	1.69	2.22	145	170	13.15	2.47
Don't Know	5	1.02	0.35	11.74	6.68	2.72	0.72	0.18	0.15	60	42	12.58	2.60

Question: Have you or others noticed a hydrogen sulfide (rotten eggs) odor in this vehicles exhaust?

Table 51

FY75 Emission Factor Program
Emission Results for 1976 Model Year Vehicles by Response to Question
Concerning Hydrogen Sulfide Odor --- 1975 FTP

		HC GM/MI		CO GM/MI		NOx GM/MI		Idle CO %		Idle HC PPM		Fuel Economy MPG	
Response	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Never	443	1.21	0.88	15.85	17.82	2.46	1.07	1.06	2.07	102	162	15.04	3.55
Rarely	34	1.43	1.13	23.23	19.67	2.29	1.15	1.36	2.40	97	124	14.27	2.26
Occasionaly	82	1.79	1.61	28.03	30.02	2.45	1.08	2.13	3.10	182	258	14.26	2.50
Regularly	73	2.06	1.20	35.34	22.52	2.47	1.29	2.98	3.12	225	266	13.80	2.63
Don't Know	7	1.73	1.38	38.62	38.68	2.41	0.81	3.16	3.99	234	177	14.26	2.29

Question: Have you or others noticed a hydrogen sulfide (rotten eggs) odor in this vehicles exhaust?

TABLE 52

ACCELERATION/DECELERATION MODES OF SURVEILLANCE DRIVING SEQUENCE

MODE			TIME IN MODE (sec)	AVERAGE SPEED (mph)	AVERAGE ACCEL-ERATION RATE (mph/sec)	DISTANCE (miles)
NO.	TYPE	SPEED RANGE (mph)				
1	ACCEL	0-30	12	18.05	2.50	0.0602
2	DECEL	30-0	16	16.68	-1.88	0.0741
3	ACCEL	0-15	8	9.04	1.88	0.0201
4	ACCEL	15-30	11	23.07	1.36	0.0705
5	ACCEL	30-45	13	37.65	1.15	0.1360
6	DECEL	45-30	12	38.05	-1.25	0.1269
7	ACCEL	30-60	17	45.00	1.76	0.2163
8	DECEL	60-45	12	53.01	-1.25	0.1716
9	ACCEL	45-60	14	52.54	1.07	0.2043
10	DECEL	60-15	30	40.40	-1.50	0.3367
11	ACCEL	15-60	26	43.42	1.73	0.3136
12	DECEL	60-0	21	33.03	-2.86	0.1973
13	ACCEL	0-60	32	38.24	1.88	0.3313
14	DECEL	60-30	23	46.00	-1.30	0.2994
15	DECEL	30-15	9	23.18	-1.67	0.0579
16	DECEL	15-0	8	7.81	-1.88	0.0173
17	ACCEL	0-45	22	28.05	2.05	0.1769
18	DECEL	45-15	16	31.33	-1.88	0.1392
19	ACCEL	15-45	18	30.55	1.67	0.1528
20	DECEL	45-0	19	24.72	-2.37	0.1304
21	ACCEL	0-60	25	30.20	2.40	0.2054
22	DECEL	60-0	20	33.80	-2.14	0.2034
23	ACCEL	0-30	15	17.73	2.00	0.0737
24	ACCEL	30-60	25	45.14	1.20	0.3134
25	DECEL	60-30	10	47.23	-1.67	0.2362
26	DECEL	30-0	10	15.09	-3.00	0.0444
27	ACCEL	0-60	38	38.01	1.58	0.4009
28	DECEL	60-0	35	33.87	-1.71	0.3293
29	ACCEL	0-30	18	17.73	1.67	0.0800
30	ACCEL	30-60	21	45.27	1.43	0.2599
31	DECEL	60-30	14	46.63	-2.14	0.1813
32	DECEL	30-0	13	16.40	-2.31	0.0592

Steady States Idle, 5 mph, 10 mph, 15 mph, 30 mph, 45 mph, 60 mph

Table 53
FY75 Emission Factor Program
Model Emission Chicago 1976 Model Year Cars (34 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	2.95	56.53	1037.77	5.97	7.81
2	0.53	10.00	348.82	0.77	24.24
3	3.68	71.73	1137.72	2.37	7.03
4	1.15	23.69	709.54	3.07	11.83
5	0.69	8.51	618.66	4.25	13.99
6	0.17	2.37	223.20	0.92	34.02
7	1.81	61.69	755.33	5.81	10.35
8	0.16	2.30	245.04	1.80	35.62
9	0.62	16.51	627.46	5.61	13.54
10	0.42	3.94	235.66	1.22	36.50
11	1.33	51.56	786.14	6.75	10.19
12	0.38	4.61	252.30	1.44	34.04
13	1.19	34.74	825.22	7.45	9.97
14	0.25	3.19	226.91	1.33	38.14
15	0.35	4.45	256.57	0.86	32.76
16	1.56	46.12	653.96	0.63	12.13
17	1.41	24.21	838.01	6.79	9.99
18	0.28	4.98	232.68	0.82	36.77
19	1.09	24.29	783.46	5.82	10.76
20	0.45	7.05	272.61	0.81	31.13
21	2.10	89.70	885.65	6.81	8.59
22	0.60	8.11	253.58	1.25	33.48
23	1.81	38.38	927.57	5.23	8.93
24	0.76	22.84	657.69	5.81	12.75
25	0.22	3.66	222.34	1.37	38.79
26	0.52	13.82	355.04	1.04	23.45
27	0.95	22.12	735.29	6.55	11.48
28	0.60	7.31	258.77	1.15	32.51
29	1.72	36.46	831.35	4.63	9.93
30	1.13	41.95	706.69	5.79	11.43
31	0.21	4.29	221.82	1.47	38.72
32	0.57	16.00	344.57	0.86	23.89
BAG	0.42	16.64	492.41	3.51	16.93
0MPH	0.40	8.60	77.41	0.12	95.28
5MPH	5.25	102.78	942.07	1.00	7.42
10MPH	1.98	42.84	505.44	0.52	13.26
15MPH	1.21	28.11	406.48	0.45	19.53
30MPH	0.41	4.30	348.03	1.25	24.93
45MPH	0.22	1.40	371.58	1.87	23.70
60MPH	0.21	2.13	435.80	3.97	20.18

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 54
FY75 Emission Factor Program
Model Emission for Chicago 1976 Model Year Light Duty Trucks (10 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	3.88	81.37	1087.11	5.32	7.23
2	0.44	6.72	406.33	0.5[illegible]	21.22
3	2.34	56.50	1279.71	2.51	6.45
4	1.37	22.60	790.04	2.90	10.69
5	0.59	8.31	688.82	4.91	12.81
6	0.28	2.19	256.83	0.6[illegible]	33.98
7	1.10	34.72	859.37	6.96	9.59
8	0.29	2.31	279.45	1.50	31.25
9	0.39	5.04	714.87	7.12	12.26
10	0.63	4.14	271.23	1.04	31.91
11	0.93	30.56	861.83	8.49	9.72
12	0.93	3.96	277.21	1.12	30.99
13	1.15	31.14	895.39	8.66	9.36
14	0.68	3.10	259.10	1.10	33.35
15	0.09	2.44	304.69	0.63	28.74
16	0.78	26.62	767.14	0.55	10.94
17	2.04	44.42	879.38	6.1[illegible]	9.21
18	0.48	3.52	265.50	0.5[illegible]	32.56
19	1.29	27.42	846.78	6.14	9.93
20	0.74	5.47	307.14	0.61	27.90
21	2.08	64.99	952.11	8.16	8.30
22	0.37	4.61	290.22	1.04	29.53
23	2.36	51.57	981.85	4.53	8.29
24	0.48	7.30	736.82	5.84	11.64
25	0.63	2.97	249.99	1.15	34.58
26	0.22	3.55	415.67	0.75	20.80
27	0.32	15.54	792.52	7.27	10.74
28	0.71	5.13	296.71	1.01	29.91
29	1.90	35.25	899.75	3.84	9.22
30	0.54	11.78	902.81	8.02	10.73
31	0.69	3.43	245.70	1.2[illegible]	35.04
32	0.27	7.82	407.74	0.67	21.09
BAG	0.80	14.35	560.63	3.74	15.15
0MPH	0.20	4.09	90.03	0.0[illegible]	91.41
5MPH	2.48	50.98	1125.29	0.82	7.32
10MPH	0.92	17.14	768.34	0.6[illegible]	11.08
15MPH	0.64	11.76	538.67	0.53	15.87
30MPH	0.16	1.30	428.34	1.04	20.60
45MPH	0.20	2.08	437.48	1.52	20.11
60MPH	0.20	3.88	506.89	3.75	17.28

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 55
FY75 Emission Factor Program
Model Emission for Denver 1970 Model Year cars (70 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON.
	----------GM/MI----------				
1	11.20	245.73	796.17	4.60	7.29
2	3.65	39.91	258.96	0.79	25.63
3	11.60	204.07	870.38	2.12	7.23
4	5.30	93.76	578.26	3.41	11.00
5	4.79	95.08	496.39	4.16	13.33
6	1.77	20.49	175.42	1.56	41.52
7	7.41	233.27	574.45	3.33	9.20
8	1.49	24.59	194.24	2.54	37.15
9	4.84	115.66	497.12	5.17	12.76
10	3.55	25.89	184.97	1.86	37.21
11	7.53	222.21	566.99	3.76	9.44
12	4.18	29.76	187.33	2.06	35.11
13	7.95	209.88	605.22	4.74	9.24
14	2.45	25.15	177.60	1.92	39.19
15	2.71	24.29	198.91	0.70	35.13
16	8.27	122.32	450.61	0.52	13.27
17	7.94	187.75	623.73	4.76	9.40
18	2.62	25.53	177.66	1.28	37.14
19	7.11	166.02	596.82	4.61	11.08
20	4.12	32.25	203.60	1.39	33.20
21	9.87	291.21	635.68	3.40	7.80
22	4.51	30.79	192.21	1.73	34.52
23	9.19	162.05	716.92	5.28	8.87
24	5.37	134.20	507.97	4.48	12.01
25	2.62	24.60	174.49	2.05	40.08
26	3.90	35.05	271.12	0.93	25.21
27	6.36	151.71	558.52	5.21	11.46
28	4.52	32.13	196.84	1.74	33.42
29	7.89	126.12	651.45	5.08	10.15
30	6.55	194.84	530.91	3.55	10.35
31	2.35	23.46	173.03	2.20	40.44
32	4.45	37.56	255.85	0.76	27.00
BAG	5.12	90.59	386.12	3.10	16.29
0MPH	1.08	16.65	55.95	0.06	103.76
5MPH	11.28	194.69	696.87	0.61	8.55
10MPH	5.06	90.94	478.66	0.42	13.92
15MPH	3.38	68.66	339.89	0.34	19.40
30MPH	2.43	25.66	280.52	1.08	27.01
45MPH	2.36	30.91	308.37	2.98	24.35
60MPH	2.84	44.87	372.48	5.37	19.64

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 56
FY75 Emission Factor Program
Model Emission For Denver 1971 Model year cars (22 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	12.32	271.03	856.54	4.34	[illegible]
2	4.27	53.48	288.16	0.56	23.01
3	14.51	232.86	973.07	2.11	[illegible]
4	6.71	126.47	627.78	3.52	10.47
5	5.04	98.70	524.84	4.34	12.75
6	2.14	23.64	182.50	1.20	[illegible]
7	7.37	243.09	584.96	3.08	[illegible]
8	2.23	28.33	201.44	2.26	[illegible]
9	5.03	137.13	509.08	4.42	11.49
10	3.70	36.76	188.89	1.57	[illegible]
11	7.30	242.13	590.50	3.59	[illegible]
12	4.54	34.96	198.08	1.71	[illegible]
13	8.14	221.72	636.60	4.61	[illegible]
14	3.23	29.18	181.61	1.67	37.34
15	3.55	36.38	213.22	0.45	31.51
16	8.80	141.43	515.63	0.42	11.53
17	8.70	197.57	676.88	5.13	[illegible]
18	3.14	31.59	186.62	1.62	[illegible]
19	7.22	183.58	635.64	4.37	[illegible]
20	4.10	39.12	217.21	1.10	[illegible]
21	10.08	328.67	669.38	3.40	[illegible]
22	4.49	37.35	200.06	1.57	[illegible]
23	10.32	177.67	781.05	5.10	[illegible]
24	5.62	154.96	518.99	4.03	11.37
25	2.39	28.54	177.63	1.76	[illegible]
26	4.84	53.28	292.27	0.58	[illegible]
27	6.43	154.96	592.87	5.24	[illegible]
28	4.29	34.84	202.59	1.41	[illegible]
29	9.07	152.71	704.76	4.41	[illegible]
30	6.73	217.68	537.94	3.11	[illegible]
31	2.87	29.10	180.02	1.87	[illegible]
32	5.25	57.87	277.19	0.56	[illegible]
BAG	5.24	106.30	401.59	2.92	[illegible]
0MPH	1.08	17.09	69.76	0.05	[illegible]
5MPH	12.43	185.26	846.86	0.63	[illegible]
10MPH	5.46	106.28	572.77	0.52	11.70
15MPH	3.71	65.45	396.21	0.39	17.37
30MPH	3.07	33.22	286.69	0.88	[illegible]
45MPH	2.57	28.24	303.39	2.85	[illegible]
60MPH	2.93	48.79	368.86	4.71	[illegible]

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MI/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 57
FY75 Emission Factor Program
Model Emission for Denver 1972 Model year Cars (25 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	11.14	217.66	854.13	4.78	7.21
2	4.92	57.57	281.77	0.54	22.38
3	13.69	234.20	949.55	1.97	6.52
4	6.30	113.94	615.85	3.36	10.96
5	4.52	74.68	528.66	4.65	13.44
6	2.17	20.79	186.64	1.28	39.24
7	6.91	220.48	584.43	3.54	9.31
8	2.21	22.71	206.12	2.38	35.67
9	4.32	97.05	520.22	5.57	12.43
10	3.64	25.61	196.34	1.78	35.77
11	7.03	205.53	596.99	4.30	9.42
12	4.41	28.26	204.85	1.80	33.72
13	7.30	185.03	641.14	5.38	9.29
14	3.09	23.58	189.08	1.82	37.52
15	3.43	34.74	209.08	0.49	32.33
16	8.28	125.00	535.10	0.41	11.69
17	7.84	162.22	670.00	5.13	9.34
18	3.27	27.97	191.51	0.99	35.10
19	6.47	137.98	639.31	4.95	10.12
20	4.20	34.34	225.52	1.07	30.41
21	9.56	288.38	655.96	3.49	7.81
22	4.52	32.77	206.89	1.54	32.55
23	9.51	154.74	769.81	5.07	8.51
24	5.00	118.47	533.22	4.88	12.06
25	3.01	24.03	182.71	1.72	38.59
26	5.16	53.48	286.49	0.64	22.34
27	5.86	124.72	595.46	5.56	10.87
28	4.36	33.30	211.01	1.57	32.02
29	8.44	134.18	695.76	4.35	9.51
30	6.14	175.80	555.94	4.02	10.44
31	2.99	25.16	181.18	1.84	38.55
32	5.13	54.15	276.54	0.51	23.49
BAG	4.97	84.48	407.80	3.34	15.95
0MPH	1.04	14.75	69.26	0.07	42.70
5MPH	12.21	180.71	860.39	0.72	7.59
10MPH	6.13	84.29	565.69	0.49	12.37
15MPH	3.62	53.10	404.79	0.39	17.76
30MPH	3.10	27.40	293.95	0.84	25.59
45MPH	2.64	22.16	316.94	2.98	24.65
60MPH	2.57	34.02	380.81	5.10	20.06

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 58
FY75 Emission Factor Program
Model Emission For Denver 1973 Model Year Cars (27 Vehicels)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	11.78	305.44	839.64	3.84	6.54
2	2.66	53.34	295.23	0.68	22.90
3	11.08	265.86	973.00	1.68	6.22
4	5.42	133.47	623.28	2.74	10.44
5	4.47	109.25	527.04	3.73	12.45
6	1.49	21.06	193.18	1.18	38.42
7	6.88	264.11	574.68	2.88	8.77
8	1.72	25.67	213.60	1.80	34.22
9	4.49	132.89	518.69	4.45	11.97
10	2.93	24.72	204.10	1.39	35.19
11	7.60	260.46	590.36	3.35	8.67
12	3.66	27.67	213.53	1.46	33.04
13	7.81	244.17	631.36	4.11	8.54
14	2.67	24.92	196.90	1.43	36.29
15	1.80	33.54	227.35	0.47	31.06
16	5.01	125.80	540.72	0.42	11.77
17	8.26	225.57	658.30	3.99	8.54
18	2.37	26.23	197.39	0.96	36.06
19	6.53	183.51	633.67	4.10	9.41
20	3.07	33.46	232.27	1.04	30.13
21	9.99	349.25	648.69	3.01	7.22
22	3.70	32.08	215.78	1.28	31.93
23	8.62	188.90	762.84	3.74	8.17
24	5.18	156.50	534.95	4.13	11.13
25	2.44	24.28	193.28	1.48	37.11
26	2.64	49.14	307.55	0.62	22.57
27	6.59	191.26	579.91	4.27	9.85
28	3.38	32.30	220.02	1.30	31.53
29	7.72	167.68	689.45	3.34	9.08
30	6.34	221.90	552.57	3.42	9.63
31	2.50	24.61	188.41	1.51	37.77
32	2.85	51.08	291.61	0.51	23.30
BAG	4.55	106.92	410.09	2.50	14.98
0MPH	0.71	16.85	66.43	0.05	93.28
5MPH	7.59	181.55	821.85	0.58	7.85
10MPH	3.70	88.26	532.05	0.41	13.00
15MPH	2.31	57.35	404.34	0.37	17.69
30MPH	1.69	32.49	307.18	1.00	24.41
45MPH	1.78	26.32	317.95	2.61	24.32
60MPH	2.18	41.93	375.26	4.08	19.81

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 59
Fy75 Emission Factor Program
Model Emission For Denver 1974 Model Year Cars (27 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL
	----------GM/MI----------				FCON
1	11.72	264.45	821.85	3.54	[illegible]
2	2.88	53.67	284.00	0.42	23.51
3	12.15	259.61	945.60	1.54	[illegible]
4	5.45	139.93	590.15	2.14	[illegible]
5	4.13	105.22	514.64	3.44	[illegible]
6	1.67	24.07	190.60	0.74	37.98
7	8.10	237.92	583.09	3.31	[illegible]
8	1.99	27.67	216.76	1.33	34.30
9	4.34	133.44	517.26	3.94	[illegible]
10	3.16	28.84	201.94	1.04	[illegible]
11	7.13	240.15	587.89	3.56	[illegible]
12	3.48	29.18	209.29	1.14	[illegible]
13	7.43	228.49	625.92	4.16	[illegible]
14	2.78	26.11	193.73	1.08	[illegible]
15	2.18	34.57	220.16	0.38	[illegible]
16	5.87	115.76	533.20	0.42	[illegible]
17	8.07	208.39	642.23	3.75	[illegible]
18	2.74	27.89	192.63	0.63	[illegible]
19	6.25	179.93	615.48	3.57	[illegible]
20	3.42	34.00	226.01	0.67	[illegible]
21	10.08	317.28	655.93	3.61	[illegible]
22	3.86	33.23	212.44	0.91	[illegible]
23	8.78	195.54	747.61	3.30	[illegible]
24	4.46	159.52	520.31	3.56	[illegible]
25	2.71	[illegible]	190.40	1.11	[illegible]
26	3.08	48.83	298.37	0.55	[illegible]
27	6.13	181.81	570.30	3.88	[illegible]
28	3.66	33.46	218.21	0.99	[illegible]
29	7.55	175.97	677.41	2.58	[illegible]
30	5.95	215.17	544.13	3.43	[illegible]
31	2.51	[illegible]	188.24	1.05	[illegible]
32	3.48	[illegible]	283.03	0.47	[illegible]
AVG	4.70	104.41	406.72	2.17	[illegible]
0MPH	0.82	[illegible]	65.70	0.06	[illegible]
5MPH	9.15	174.64	825.36	0.71	[illegible]
10MPH	3.97	90.06	512.67	0.42	[illegible]
15MPH	2.77	63.76	378.03	0.33	[illegible]
30MPH	1.71	34.44	295.19	0.74	[illegible]
45MPH	1.77	31.74	324.10	1.91	[illegible]
60MPH	2.14	46.17	385.19	3.40	[illegible]

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MPH/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 60
Fy75 Emission Factor Program
Model Emissions For Denver 1975 Model Year Cars (28 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				MI/GAL
1	5.39	188.63	942.00	4.08	7.07
2	1.65	33.19	319.87	0.49	23.53
3	5.11	164.86	1033.46	1.81	6.78
4	2.82	83.66	659.01	2.20	11.10
5	2.05	66.79	571.80	3.18	12.49
6	0.97	16.15	212.06	0.60	36.30
7	4.00	241.89	639.77	3.49	8.60
8	1.02	20.60	235.70	1.24	32.72
9	2.19	112.30	562.23	3.61	11.90
10	1.47	17.20	224.56	0.83	34.64
11	4.14	237.05	648.83	3.38	8.58
12	1.88	19.73	238.59	0.97	32.21
13	4.09	211.32	701.01	3.83	8.48
14	1.42	19.86	212.96	0.91	35.69
15	1.35	24.86	234.72	0.49	31.42
16	3.02	78.76	596.88	0.43	12.15
17	3.97	153.50	741.01	3.71	8.92
18	1.44	21.47	213.68	0.47	35.22
19	3.27	136.02	697.08	3.57	9.60
20	1.87	25.25	252.08	0.49	29.81
21	5.65	317.38	721.90	3.55	7.21
22	2.00	24.08	237.94	0.82	31.46
23	4.31	127.88	856.56	3.38	8.29
24	2.03	132.94	575.19	3.38	11.20
25	1.30	20.33	211.02	0.94	35.92
26	1.84	36.04	322.77	0.65	23.04
27	3.04	136.76	652.21	3.63	10.12
28	1.76	22.12	244.52	0.83	31.16
29	3.64	110.10	771.96	2.54	8.28
30	3.45	197.62	602.16	3.19	9.61
31	1.26	20.19	212.24	0.96	35.79
32	1.81	31.36	318.29	0.57	23.77
BAG	2.33	85.64	448.63	2.11	15.63
0MPH	0.32	8.80	75.78	0.00	97.92
5MPH	3.79	95.16	926.22	0.84	8.16
10MPH	1.86	40.52	571.68	0.45	13.84
15MPH	1.31	24.98	396.48	0.38	19.49
30MPH	0.83	14.58	319.33	1.28	25.50
45MPH	0.77	17.37	353.72	1.38	23.14
60MPH	0.99	29.86	418.85	3.05	18.93

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 61
FY75 Emission Factor Program
Model Emissions for Denver 1976 Model Year cars (34 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	6.22	201.59	902.33	3.64	7.14
2	1.61	29.17	297.10	0.56	25.50
3	6.06	147.52	1002.28	2.02	7.08
4	2.86	85.62	630.58	2.20	11.46
5	2.12	78.32	545.98	2.80	13.13
6	0.78	13.76	207.33	0.71	38.35
7	3.63	217.98	625.64	2.93	8.06
8	0.86	16.28	239.55	1.47	33.13
9	2.18	106.05	551.02	3.12	12.25
10	1.28	15.06	217.87	1.01	36.14
11	3.94	213.12	655.21	2.84	8.85
12	1.53	16.91	234.68	1.15	33.35
13	3.93	195.52	702.46	3.29	8.68
14	1.05	15.25	215.04	1.07	36.63
15	1.10	18.98	230.59	0.56	33.63
16	3.37	64.82	548.54	0.47	13.43
17	3.99	160.15	726.41	3.23	8.95
18	1.08	15.93	211.65	0.55	36.96
19	3.17	134.97	677.79	3.25	9.84
20	1.53	19.17	243.52	0.62	31.87
21	5.36	297.15	721.69	2.83	7.36
22	1.56	18.25	235.08	1.01	32.99
23	3.95	119.52	837.51	3.39	6.55
24	2.63	132.54	566.53	2.89	11.33
25	0.96	15.02	213.38	1.13	36.74
26	1.59	29.58	339.20	0.87	22.70
27	3.17	143.41	644.15	3.44	10.09
28	1.61	19.31	237.44	0.99	32.52
29	3.58	103.14	754.35	2.82	9.57
30	3.21	181.38	593.43	2.88	9.99
31	0.97	17.39	216.76	1.20	35.91
32	1.58	26.56	295.10	0.64	25.96
BAG	2.26	79.59	440.00	1.95	15.51
0MPH	0.51	11.44	60.37	0.05	110.99
5MPH	6.34	127.81	747.04	0.65	9.17
10MPH	3.28	66.95	512.07	0.45	14.14
15MPH	2.04	44.19	351.37	0.38	20.77
30MPH	0.91	18.49	307.41	0.93	26.15
45MPH	0.74	13.03	338.08	1.65	24.59
60MPH	1.03	25.86	420.79	3.37	19.10

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MI/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 62
FY75 Emission Factor Program
Model Emission for Denver 1975 and 1976 Light Duty Trucks (17 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	7.20	194.99	937.58	3.43	7.01
2	1.73	25.72	378.95	0.49	20.39
3	4.99	105.36	1113.96	1.93	5.85
4	3.07	87.04	667.49	1.79	10.90
5	1.84	54.56	589.52	2.83	13.03
6	0.89	18.02	267.91	0.57	29.68
7	3.33	217.49	667.45	2.81	8.70
8	0.95	16.88	309.54	1.56	25.17
9	1.59	63.32	636.15	3.77	11.98
10	1.25	13.40	278.91	1.06	29.20
11	3.34	172.24	722.83	3.64	8.84
12	1.67	15.38	301.62	1.15	26.81
13	3.44	156.53	773.71	4.23	8.51
14	1.11	14.24	273.01	1.11	29.59
15	0.94	15.01	306.63	0.45	25.64
16	3.20	52.66	720.74	0.56	10.91
17	4.45	144.91	778.79	3.91	8.70
18	1.32	18.09	272.99	0.50	29.04
19	3.11	130.20	709.91	3.32	9.60
20	1.58	20.33	316.12	0.51	25.11
21	5.15	275.37	769.07	3.24	7.29
22	1.66	17.59	300.42	1.04	26.63
23	4.24	110.53	893.65	3.22	8.21
24	2.20	104.31	631.44	3.25	11.06
25	1.16	15.53	271.46	1.15	29.63
26	1.54	20.73	405.89	0.67	20.02
27	2.81	103.19	712.22	4.13	10.05
28	1.49	17.14	302.65	1.03	26.55
29	4.10	107.97	813.87	2.56	8.91
30	3.11	181.09	639.11	2.72	9.51
31	1.15	15.72	275.89	1.24	29.17
32	1.45	17.92	390.79	0.55	20.96
BAG	2.02	66.99	511.44	2.05	14.24
0MPH	0.41	7.56	84.39	0.10	90.94
5MPH	4.93	88.21	1026.08	0.92	7.52
10MPH	2.31	38.48	633.83	0.57	12.65
15MPH	1.70	25.68	454.33	0.43	17.75
30MPH	0.80	14.52	367.40	0.86	22.60
45MPH	0.70	14.49	390.97	1.47	21.34
60MPH	0.72	22.72	495.35	3.43	15.64

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 63
FY75 Emission Factor Program
Model Emissions For Houston 1976 Model Year Cars (34 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	GM/MI				
1	3.59	66.67	1100.98	6.96	7.29
2	0.89	9.74	375.52	1.03	22.55
3	4.62	88.88	1194.90	3.17	6.58
4	1.82	26.03	753.45	3.83	11.09
5	0.99	11.01	656.69	5.20	13.11
6	0.42	1.98	238.53	0.94	35.53
7	1.87	60.95	821.20	7.40	9.62
8	0.34	2.14	257.29	1.92	33.91
9	0.85	14.91	668.57	6.72	12.78
10	0.90	3.77	251.30	1.31	34.13
11	1.55	44.85	831.17	8.34	9.79
12	1.05	4.30	268.26	1.56	31.89
13	1.49	36.64	873.10	8.74	9.49
14	0.64	2.99	241.18	1.43	35.80
15	0.38	5.87	279.69	0.91	30.59
16	1.92	52.04	705.08	0.92	11.19
17	1.70	33.97	884.05	7.53	9.41
18	0.64	4.07	247.36	0.77	34.70
19	1.45	27.42	823.44	6.74	10.19
20	1.03	6.72	293.00	0.85	28.93
21	2.30	80.67	953.47	8.82	8.16
22	1.06	5.81	273.90	1.39	30.99
23	2.29	40.72	979.29	6.20	8.45
24	0.95	21.11	700.51	6.95	12.05
25	0.57	3.01	239.86	1.51	36.02
26	0.61	10.14	384.74	1.28	22.05
27	1.21	25.42	778.49	7.67	10.79
28	1.04	6.77	278.12	1.33	30.39
29	2.04	37.46	878.38	5.24	8.49
30	1.25	34.60	759.93	7.37	10.85
31	0.46	3.33	235.95	1.62	36.53
32	0.74	12.47	371.17	1.10	22.58
BAG	1.09	18.31	522.56	4.13	16.00
0MPH	0.47	10.16	82.24	0.14	84.01
5MPH	5.92	115.26	993.50	1.42	7.44
10MPH	2.82	48.57	598.61	0.74	12.98
15MPH	1.75	30.52	404.53	0.49	19.38
30MPH	0.56	3.04	354.40	1.40	24.59
45MPH	0.44	1.35	383.98	1.87	22.90
60MPH	0.33	1.97	453.88	4.22	19.38

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 64
FY75 Emission Factor Program
Model Emissions for Houston 1976 Model year Light Duty Trucks (10 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	7.39	99.44	1027.93	9.20	7.35
2	2.16	40.55	339.41	0.56	21.65
3	8.21	173.46	1120.70	2.08	6.25
4	2.57	50.56	693.52	5.00	11.35
5	1.02	16.64	618.53	7.24	13.70
6	0.44	5.71	237.08	1.42	35.87
7	1.47	38.87	813.85	9.56	10.09
8	0.26	2.74	260.96	2.31	33.36
9	0.57	6.86	662.17	8.60	13.15
10	1.85	5.20	251.72	1.59	32.81
11	1.83	44.48	802.14	9.62	10.11
12	2.16	7.93	266.76	1.87	31.33
13	1.73	37.85	845.44	10.74	9.75
14	1.18	5.88	242.66	1.75	34.72
15	1.01	28.40	266.12	0.61	28.55
16	3.85	106.37	669.93	0.44	10.45
17	3.12	60.64	837.67	9.09	9.41
18	1.49	11.73	242.36	1.14	33.43
19	2.03	41.71	773.17	8.42	10.50
20	2.44	17.07	278.14	1.16	28.38
21	3.08	64.13	918.45	10.34	8.56
22	2.19	11.31	270.24	1.72	30.09
23	4.23	75.10	914.61	8.09	8.48
24	0.73	11.31	584.67	9.37	12.59
25	0.99	5.04	237.80	1.86	35.86
26	1.60	39.49	352.70	0.77	21.14
27	1.38	23.48	755.41	9.86	11.14
28	2.27	13.02	269.35	1.61	29.88
29	3.57	62.99	830.12	6.79	9.44
30	1.05	25.68	743.26	9.59	11.28
31	0.73	4.50	238.09	2.03	35.86
32	1.91	41.61	342.77	0.64	21.43
BAG	1.68	24.45	509.86	4.83	15.03
0MPH	1.02	16.79	70.00	0.04	86.37
5MPH	10.13	228.01	880.93	0.40	6.98
10MPH	3.72	100.03	624.21	0.42	11.19
15MPH	2.42	64.85	425.24	0.33	16.36
30MPH	0.93	24.97	321.95	0.90	24.37
45MPH	0.38	4.86	382.68	2.42	22.67
60MPH	0.16	0.82	429.96	4.28	20.56

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 65
FY75 Emission Factor Program
Model Emissions for Los Angeles 1970 Model Year Cars (20 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	7.35	70.55	924.33	12.18	9.38
2	3.30	39.59	326.42	1.01	22.24
3	9.56	136.45	954.21	4.54	7.40
4	3.95	34.05	658.54	7.60	12.25
5	2.83	15.46	550.49	9.73	15.20
6	2.38	12.58	221.26	2.04	35.71
7	3.96	61.82	667.32	10.65	11.42
8	2.45	10.94	267.65	3.60	30.33
9	2.51	15.48	558.98	11.31	15.01
10	3.44	17.61	225.37	2.31	33.62
11	3.65	40.57	686.02	12.95	11.66
12	4.48	22.31	242.09	2.61	30.46
13	3.81	37.26	682.37	12.90	11.79
14	3.11	13.77	265.22	3.38	29.91
15	3.05	24.15	299.77	1.37	25.55
16	6.20	110.62	607.05	1.00	11.09
17	4.47	34.29	681.89	11.92	11.71
18	3.08	17.90	262.41	2.26	29.55
19	3.84	31.83	592.65	9.66	13.55
20	3.94	25.71	288.13	2.45	26.03
21	4.62	64.94	722.89	12.10	10.57
22	4.23	20.86	283.92	3.23	26.89
23	5.78	61.48	741.55	9.30	10.36
24	2.47	16.59	492.32	9.29	16.87
25	2.86	13.25	322.30	4.51	25.21
26	3.84	33.52	446.36	1.92	17.36
27	3.24	27.47	583.86	11.29	13.93
28	3.95	20.72	309.76	3.64	25.31
29	5.05	53.45	629.10	6.52	12.17
30	2.72	20.80	495.80	9.13	16.52
31	2.67	13.28	344.96	5.20	23.71
32	3.90	37.27	412.35	1.59	18.36
BAG	3.31	27.00	441.70	6.50	17.94
0MPH	0.92	16.16	65.39	0.05	94.69
5MPH	10.11	190.68	840.37	0.61	7.57
10MPH	4.33	76.08	598.34	0.62	12.13
15MPH	2.73	41.68	447.75	0.63	17.01
30MPH	1.64	12.28	322.69	1.45	25.56
45MPH	1.81	5.88	335.35	4.55	25.33
60MPH	1.91	11.08	395.28	7.34	21.19

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 66
FY75 Emission Factor Program
Model Emissions for Los Angeles 1971 Model Year Cars (22 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL FCON
	----------GM/MI----------				
1	9.54	105.80	1065.08	9.90	7.04
2	3.77	39.77	351.56	0.99	20.83
3	11.59	161.29	1197.72	4.39	5.96
4	5.63	53.20	766.63	5.92	10.22
5	4.46	34.14	622.78	8.11	12.65
6	2.78	16.75	237.67	1.77	32.54
7	6.42	124.11	743.09	8.14	9.26
8	2.82	18.58	249.76	3.14	30.83
9	4.20	41.39	622.74	9.98	12.66
10	3.24	20.83	250.92	2.31	30.20
11	5.87	78.70	767.65	10.86	9.75
12	4.16	24.36	239.74	2.35	30.47
13	5.73	69.68	774.84	10.99	9.83
14	3.30	20.96	266.56	2.91	28.53
15	3.29	28.13	324.98	1.18	23.38
16	6.98	104.68	650.02	0.71	10.61
17	5.95	63.48	789.24	9.64	9.78
18	3.26	22.62	278.40	1.83	27.37
19	5.07	51.20	715.13	8.60	10.93
20	4.11	30.88	320.52	1.96	23.23
21	6.86	122.73	811.53	9.67	8.65
22	4.26	27.35	295.60	2.83	25.21
23	7.40	85.39	877.31	7.28	8.58
24	4.06	40.22	578.32	8.45	13.56
25	3.34	22.30	303.39	3.80	25.43
26	4.86	40.07	454.69	1.92	16.67
27	4.82	50.10	672.77	9.91	11.57
28	3.96	29.37	315.74	3.11	23.70
29	6.57	73.10	767.24	5.74	9.83
30	4.45	52.78	595.50	8.13	12.82
31	3.51	25.23	332.68	4.42	23.14
32	4.84	42.78	440.68	1.60	16.96
BAG	4.33	43.88	484.54	5.49	15.65
0MPH	1.07	14.33	74.73	0.10	88.20
5MPH	12.78	163.15	929.72	0.82	7.24
10MPH	5.72	76.45	592.28	0.53	12.15
15MPH	3.73	43.20	446.62	0.43	16.86
30MPH	2.43	19.84	354.78	1.42	22.46
45MPH	2.57	17.13	371.42	3.54	21.83
60MPH	2.78	25.59	434.93	6.80	18.34

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 67
FY75 Emission Factor Program
Model Emissions for Los Angeles 1972 Model Year Cars (25 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	7.35	76.06	1091.38	8.24	7.19
2	1.49	27.65	403.07	0.85	19.61
3	7.64	106.42	1223.99	3.43	6.27
4	3.51	31.98	764.83	4.47	10.74
5	2.78	18.42	623.83	7.16	13.42
6	1.72	7.48	281.41	1.97	29.72
7	5.02	104.34	707.95	7.03	10.06
8	1.85	7.87	340.66	3.92	24.73
9	2.70	30.57	621.08	8.68	13.10
10	2.49	11.23	293.04	2.64	27.85
11	5.32	81.41	778.93	8.83	9.61
12	3.35	13.42	325.04	3.07	24.83
13	3.28	57.13	793.33	9.23	9.93
14	2.03	8.90	332.50	3.62	25.15
15	1.42	14.02	361.87	1.11	22.85
16	3.27	72.31	810.73	0.69	9.50
17	4.61	45.57	808.65	8.45	9.92
18	2.12	11.07	338.87	2.46	24.45
19	2.48	33.18	705.25	6.64	11.60
20	2.54	14.37	392.91	2.54	20.96
21	4.34	113.84	800.10	7.62	8.94
22	2.85	13.09	373.00	3.62	22.05
23	4.55	52.70	893.67	5.63	8.96
24	1.86	22.93	563.75	7.47	14.65
25	1.78	8.58	407.95	4.77	20.78
26	2.23	19.31	560.80	1.76	14.84
27	2.39	35.00	674.50	8.64	12.04
28	2.41	13.27	401.21	3.86	20.65
29	5.87	53.54	718.50	3.98	10.21
30	2.98	42.39	560.18	6.78	13.95
31	1.96	10.12	437.87	5.57	19.30
32	2.26	22.99	494.10	1.53	16.52
BAG	2.87	31.31	532.55	5.25	15.02
0MPH	0.55	10.71	85.43	0.06	85.35
5MPH	6.16	117.27	1041.81	0.63	7.13
10MPH	2.59	40.73	695.07	0.53	11.57
15MPH	1.75	23.02	515.89	0.60	15.92
30MPH	1.01	6.84	398.03	1.18	21.54
45MPH	1.03	5.82	397.21	3.67	21.57
60MPH	0.96	7.90	461.98	6.65	18.59

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 68
FY75 Emission Factor Program
Model Emissions for Los Angeles 1973 Model Year Cars (27 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	5.69	66.84	1048.32	9.53	7.58
2	2.37	37.30	395.80	1.06	19.21
3	6.99	100.32	1155.86	4.24	6.64
4	3.13	39.66	728.90	5.63	11.08
5	2.22	21.90	627.25	7.25	13.27
6	1.98	12.02	277.64	1.91	29.31
7	3.05	70.77	719.95	8.80	10.56
8	2.30	16.49	300.57	3.05	25.59
9	2.12	29.23	601.61	8.44	13.57
10	3.05	15.69	269.84	2.17	29.18
11	3.37	52.94	770.57	10.09	10.17
12	3.86	21.67	290.37	2.45	26.36
13	3.04	53.57	771.17	9.54	10.26
14	2.57	16.28	309.73	2.53	25.82
15	1.53	24.20	339.58	1.05	23.21
16	3.99	85.52	725.75	0.86	10.17
17	3.53	50.84	786.39	8.43	10.11
18	2.50	19.96	313.20	1.79	25.19
19	2.99	41.21	687.48	7.35	11.65
20	2.99	25.17	363.19	1.98	21.53
21	3.81	85.66	816.04	9.06	9.22
22	3.17	24.03	337.53	2.45	22.49
23	4.19	52.67	855.68	6.61	9.23
24	1.92	30.35	577.01	6.75	15.07
25	2.31	15.53	342.19	3.49	23.74
26	2.40	35.54	516.07	1.81	15.31
27	2.50	36.71	685.81	7.86	11.81
28	3.20	20.13	362.66	2.60	21.94
29	3.72	51.02	731.20	4.93	10.78
30	2.62	41.02	589.17	6.71	13.45
31	2.17	18.27	371.41	3.91	21.81
32	2.33	34.64	463.95	1.20	16.88
BAG	2.60	32.58	512.77	4.84	15.51
0MPH	0.55	10.00	85.17	0.06	55.21
5MPH	8.17	106.86	1046.01	0.74	7.15
10MPH	6.23	51.03	660.57	2.82	11.67
15MPH	3.54	33.17	493.94	0.64	15.93
30MPH	1.47	23.03	364.85	1.33	21.88
45MPH	1.58	10.47	392.77	3.46	21.43
60MPH	1.64	12.85	447.81	6.08	18.76

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 69
FY75 Emission Factor Program
Model Emissions for Los Angeles 1974 Model Year Cars (27 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	10.39	89.59	1151.00	6.37	6.70
2	3.33	22.03	424.95	0.65	18.88
3	11.29	101.40	1314.20	2.63	5.48
4	5.48	34.90	813.60	3.37	10.02
5	4.35	29.58	669.15	4.20	12.17
6	2.88	7.96	288.44	0.99	28.62
7	6.16	115.82	782.44	5.99	9.02
8	3.07	8.19	345.81	1.88	24.09
9	3.11	51.38	638.37	5.19	12.19
10	3.08	9.07	298.67	1.24	27.50
11	7.20	97.37	815.25	6.81	8.96
12	4.23	12.89	328.37	1.49	24.52
13	7.21	87.30	825.58	6.50	9.00
14	3.05	8.82	327.41	1.71	25.29
15	2.23	13.23	397.46	0.74	20.87
16	5.93	58.56	842.60	0.72	9.31
17	7.20	67.82	861.49	5.85	8.96
18	3.05	10.24	334.51	1.06	24.63
19	5.75	54.84	760.70	4.69	10.26
20	3.74	14.25	387.64	1.12	21.04
21	7.70	129.84	876.23	6.65	8.93
22	3.81	12.74	358.30	1.70	22.73
23	7.41	58.63	956.12	4.04	8.31
24	4.08	43.82	610.09	4.43	12.83
25	2.89	9.98	384.40	2.35	21.69
26	3.50	22.86	549.77	1.11	14.87
27	5.78	58.87	726.72	5.57	10.64
28	3.48	12.40	385.92	1.92	21.31
29	5.59	45.20	829.21	2.90	9.67
30	4.65	60.18	625.74	4.59	12.07
31	2.98	12.11	414.31	2.57	20.04
32	3.72	24.38	501.71	1.06	16.08
BAG	4.27	36.84	551.47	3.27	14.25
0MPH	0.94	9.29	86.61	0.06	85.19
5MPH	10.23	93.32	1097.48	0.74	6.95
10MPH	4.57	46.77	716.37	0.56	11.03
15MPH	2.77	26.93	516.90	0.48	15.63
30MPH	1.98	9.79	411.18	1.05	20.51
45MPH	1.77	6.79	422.76	1.84	20.21
60MPH	1.71	9.66	477.75	3.95	17.91

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 70
FY75 Emission Factor Program
Model Emissions for Los Angeles 1975 Model Cars (28 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	1.05	16.77	1232.54	5.43	7.03
2	0.59	4.00	443.40	0.67	19.65
3	1.50	21.93	1315.71	2.87	6.55
4	0.45	7.53	824.10	3.05	10.60
5	0.30	3.53	700.56	3.81	12.55
6	0.31	1.36	311.48	0.92	28.21
7	1.23	77.31	815.63	5.40	9.43
8	0.34	1.44	370.91	1.70	23.71
9	0.33	16.23	677.61	4.70	12.50
10	0.41	2.03	323.95	1.30	27.02
11	0.78	42.45	889.31	5.71	9.26
12	0.54	2.74	359.51	1.34	24.24
13	0.68	32.54	899.38	5.45	9.32
14	0.32	1.93	356.35	1.68	24.63
15	0.19	3.32	401.24	0.76	21.50
16	0.88	19.62	806.21	0.75	10.57
17	0.63	14.74	911.02	4.75	9.48
18	0.36	3.14	376.36	1.13	23.21
19	0.49	14.00	783.78	3.94	10.99
20	0.52	3.81	434.78	1.18	20.06
21	1.36	75.19	928.95	5.75	8.44
22	0.47	2.87	405.33	1.70	21.53
23	0.78	14.88	959.66	3.60	9.01
24	0.33	15.49	641.47	3.94	13.31
25	0.25	2.04	425.36	2.32	20.67
26	0.33	5.39	583.39	1.34	14.97
27	0.43	13.83	774.96	4.61	11.12
28	0.44	2.85	425.51	1.90	20.67
29	0.78	13.87	808.19	2.81	10.66
30	0.49	29.78	650.89	3.97	12.69
31	0.24	2.25	454.02	2.52	19.35
32	0.38	6.49	536.07	1.15	16.21
BAG	0.47	13.14	542.51	2.42	14.44
0MPH	0.20	1.38	90.49	0.07	93.15
5MPH	1.38	14.79	1117.17	0.69	7.75
10MPH	0.59	7.46	678.46	0.57	12.52
15MPH	0.29	0.47	511.82	0.51	17.28
30MPH	0.22	0.99	425.15	1.32	20.77
45MPH	0.13	0.75	441.92	1.83	20.01
60MPH	0.12	0.97	509.44	3.56	17.36

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MI/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 71
FY75 Emission Factor Program
Model Emission for Los Angeles 1976 Model Year Cars (34 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	0.72	15.15	1201.11	4.82	7.23
2	0.17	2.52	409.20	0.52	21.45
3	0.58	12.48	1302.82	2.72	6.70
4	0.38	4.52	797.23	2.64	11.02
5	0.32	5.29	682.13	3.23	12.84
6	0.19	0.86	277.60	0.63	31.75
7	0.96	54.19	808.38	4.63	9.40
8	0.15	0.49	326.64	1.29	27.07
9	0.25	5.05	683.79	4.15	12.73
10	0.12	0.93	290.70	0.89	30.34
11	0.54	29.28	853.32	5.40	9.85
12	0.15	1.58	318.10	1.05	27.54
13	0.44	22.98	853.22	5.15	9.46
14	0.11	0.75	323.27	1.19	27.33
15	0.09	1.64	358.76	0.64	24.54
16	0.25	5.75	769.61	0.81	11.35
17	0.44	13.71	871.79	4.20	9.92
18	0.15	1.92	327.66	0.64	26.40
19	0.39	12.09	752.57	3.60	11.48
20	0.19	3.02	381.79	0.74	22.93
21	0.92	55.85	904.27	5.55	8.42
22	0.15	1.76	357.55	1.15	24.60
23	0.38	5.48	946.01	3.39	9.24
24	0.27	10.83	606.47	3.45	14.22
25	0.13	1.26	380.24	1.55	23.20
26	0.18	3.46	539.69	0.97	15.26
27	0.35	14.15	726.80	4.13	11.83
28	0.17	2.37	383.75	1.28	22.87
29	0.38	6.50	787.19	2.58	11.07
30	0.40	21.10	630.42	3.51	13.38
31	0.12	1.31	413.55	1.73	21.34
32	0.17	4.41	485.33	0.81	18.01
BAG	0.27	4.22	553.40	2.50	15.51
0MPH	0.06	0.62	90.88	0.03	99.47
5MPH	1.02	10.67	1113.05	0.93	7.83
10MPH	0.40	2.89	662.66	0.54	13.29
15MPH	0.22	1.16	464.06	0.50	19.02
30MPH	0.19	0.80	384.02	0.82	23.00
45MPH	0.14	0.52	394.61	1.14	22.42
60MPH	0.09	0.84	464.63	2.88	19.04

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 72
FY75 Emission Factor Program
Model Emissions for Los Angeles 1975 and 1976 Model Year Trucks (17 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	---------GM/MI---------				
1	2.37	45.41	1106.09	5.51	7.49
2	0.54	[illegible]	417.60	0.63	20.51
3	1.50	34.99	1314.52	3.32	[illegible]
4	0.94	15.89	784.98	3.13	[illegible]
5	0.55	7.68	636.90	3.72	13.84
6	0.65	2.36	307.00	0.72	28.29
7	1.48	72.01	751.74	6.29	10.21
8	0.55	3.29	357.59	1.62	24.35
9	0.37	4.83	653.68	5.22	13.40
10	0.53	4.33	306.91	1.08	28.13
11	1.12	40.69	800.66	6.24	10.22
12	0.57	5.24	339.04	1.17	25.40
13	1.06	36.07	795.70	6.27	10.37
14	0.51	3.73	348.31	1.50	24.94
15	0.27	9.05	355.01	0.73	23.98
16	0.20	13.97	908.52	0.81	[illegible]
17	1.16	25.31	817.28	5.09	10.31
18	0.52	4.15	334.70	0.83	25.89
19	0.85	28.32	708.27	4.19	11.95
20	0.56	5.62	390.11	0.96	22.13
21	2.12	92.94	812.55	5.54	[illegible]
22.	0.55	4.87	381.29	1.45	22.70
23	1.47	28.90	928.72	4.04	[illegible]
24	0.43	6.69	605.88	4.24	14.29
25	0.47	3.64	399.11	2.09	21.04
26	0.39	11.95	572.50	1.11	14.98
27	0.64	12.31	705.15	5.31	12.22
28	0.54	5.04	401.18	1.70	21.50
29	1.08	22.81	802.21	3.24	10.55
30	0.65	25.56	621.25	4.57	13.38
31	0.46	3.65	460.22	2.34	17.49
32	0.46	10.87	487.88	0.93	17.53
BAG	0.56	14.49	551.96	3.11	15.39
0MPH	0.19	2.67	85.79	0.05	97.93
5MPH	2.56	39.20	1041.55	0.61	7.49
10MPH	0.73	6.35	775.46	0.61	11.27
15MPH	0.35	3.77	594.10	0.63	14.76
30MPH	0.54	6.35	406.21	1.08	21.24
45MPH	0.27	3.62	421.63	1.67	20.73
60MPH	0.25	3.15	492.61	3.44	17.81

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 74
FY75 Emission Factor Program
Model Emissions For St. Louis 1970 Model Year Cars (19 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL
	----------GM/MI----------				
1	7.11	98.17	889.10	8.65	[illegible]
2	3.43	42.63	310.78	0.92	22.34
3	9.85	174.82	932.86	2.03	7.16
4	3.83	52.18	621.89	4.62	12.40
5	2.83	28.71	539.07	6.64	14.04
6	2.07	14.75	220.25	2.36	[illegible]
7	4.11	71.52	679.19	9.93	11.03
8	2.15	14.80	245.82	4.31	32.17
9	2.53	24.11	540.18	9.69	15.14
10	3.72	19.75	220.25	2.69	33.74
11	3.76	49.53	698.87	12.57	11.25
12	4.89	23.34	235.92	3.44	30.41
13	3.94	50.78	688.14	11.82	11.37
14	2.84	18.16	248.38	3.75	31.04
15	2.15	27.32	313.06	0.92	24.45
16	5.50	107.39	622.39	0.65	13.48
17	4.44	54.17	692.87	10.00	11.21
18	2.70	21.56	264.39	2.79	23.92
19	3.44	42.00	585.44	7.03	13.40
20	3.88	27.95	295.88	3.07	25.21
21	5.06	108.61	721.00	9.75	[illegible]
22	4.41	23.46	278.09	3.84	25.92
23	6.06	77.74	701.21	5.85	11.53
24	2.52	25.69	498.34	7.50	15.23
25	2.25	18.62	304.53	5.15	25.03
26	3.65	47.33	461.88	1.35	15.20
27	3.18	35.14	593.44	10.34	13.47
28	3.98	25.63	301.40	4.07	25.05
29	5.01	78.54	584.02	3.97	12.43
30	2.62	29.95	500.84	7.42	15.75
31	2.29	18.82	331.56	5.93	24.09
32	3.40	44.34	392.56	1.37	18.76
BAG	3.55	35.55	440.24	6.62	17.44
0MPH	1.13	17.66	64.84	0.05	92.28
5MPH	11.44	188.80	856.95	0.70	7.46
10MPH	5.23	85.63	579.15	0.60	12.15
15MPH	3.36	50.30	445.78	0.50	16.57
30MPH	1.87	19.48	322.17	1.11	24.74
45MPH	1.64	13.03	334.79	3.95	24.62
60MPH	1.70	17.11	388.23	6.81	21.11

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 75
FY75 Emission Factor Program
Model Emission for St. Louis 1971 Model Year Cars (22 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				MI/GAL
1	7.58	89.58	942.05	4.57	8.02
2	3.44	40.34	364.29	1.13	20.24
3	9.53	137.64	989.07	2.93	7.18
4	4.61	41.46	651.55	5.31	12.14
5	3.52	29.75	556.59	7.93	14.79
6	2.13	13.22	244.45	2.42	32.63
7	5.43	106.97	674.92	8.81	10.32
8	2.77	13.64	277.33	4.22	24.86
9	3.42	24.78	568.20	10.25	14.35
10	3.15	20.33	242.37	2.67	31.22
11	5.37	72.32	708.24	11.40	10.58
12	4.06	25.94	265.92	3.45	27.77
13	5.40	62.73	724.68	11.33	10.56
14	3.27	18.56	269.02	3.72	24.76
15	2.91	26.24	304.18	1.07	28.41
16	7.84	119.82	663.78	0.65	15.12
17	5.69	55.28	722.14	10.31	10.73
18	3.05	22.33	278.85	2.57	27.43
19	4.53	47.25	639.02	7.69	12.20
20	3.55	31.43	316.79	2.73	23.51
21	6.30	121.97	750.49	9.72	9.22
22	4.18	27.83	296.64	3.67	25.10
23	6.36	84.99	774.32	6.41	9.58
24	3.49	30.86	523.06	8.34	15.23
25	3.15	20.27	322.67	5.25	24.35
26	4.43	37.78	465.69	1.85	16.46
27	4.46	42.02	619.23	10.03	12.59
28	3.44	24.36	320.18	3.94	23.53
29	5.55	71.24	630.20	4.73	11.68
30	3.62	43.16	522.63	7.61	14.75
31	3.39	22.07	337.30	5.75	23.19
32	4.25	45.86	419.30	1.46	17.58
BAG	4.21	40.29	458.50	6.56	16.58
0MPH	0.94	16.00	74.56	0.07	99.43
5MPH	10.58	160.73	950.51	0.83	7.18
10MPH	6.29	77.52	597.54	0.52	12.00
15MPH	4.05	42.38	443.33	0.52	15.98
30MPH	2.52	13.61	327.76	1.32	24.85
45MPH	2.17	9.98	345.77	3.89	24.10
60MPH	2.40	15.04	403.37	6.85	20.42

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IS MI/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 76
FY75 Emission Factor Program
Model Emission For St. Louis 1972 Model Year Cars (25 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL
	----------GM/MI----------				MI/GAL
1	6.17	90.85	927.53	10.33	[illegible].14
2	2.33	37.43	358.43	1.45	20.90
3	7.27	154.92	965.76	3.00	7.29
4	3.18	45.34	656.38	5.74	12.03
5	2.48	20.76	557.64	8.49	14.84
6	1.79	12.29	293.01	2.90	30.40
7	3.26	63.93	708.24	11.87	13.84
8	2.26	11.24	271.45	5.51	29.46
9	2.91	15.71	579.74	12.27	14.53
10	3.09	17.66	241.04	3.49	31.86
11	3.18	47.11	736.21	14.32	10.82
12	4.13	23.35	253.86	4.32	29.23
13	3.42	47.50	727.42	13.56	10.42
14	2.69	16.48	266.73	4.66	29.47
15	1.49	30.14	303.36	1.39	24.88
16	5.17	118.68	626.52	0.77	10.70
17	3.47	53.97	714.27	10.96	10.94
18	2.18	21.50	276.69	3.04	27.96
19	3.01	43.73	641.52	8.80	13.33
20	2.90	29.92	311.88	3.17	24.11
21	4.42	85.97	779.85	12.69	9.55
22	3.71	25.46	292.34	4.62	25.79
23	5.27	84.08	761.39	7.06	9.75
24	2.18	22.82	529.55	9.37	15.51
25	2.38	16.17	315.91	6.42	25.44
26	2.91	43.79	452.85	2.06	15.72
27	2.91	36.52	619.63	11.29	12.87
28	3.36	25.67	318.89	5.07	24.00
29	4.60	79.29	632.60	4.96	11.50
30	2.41	33.45	547.10	8.81	14.61
31	2.33	18.32	335.51	7.29	23.88
32	2.42	45.85	402.29	1.70	18.35
BAG	3.05	34.50	465.46	7.75	15.77
0MPH	0.77	15.52	74.27	0.04	86.45
5MPH	7.46	173.72	931.51	0.93	7.22
10MPH	4.46	68.34	646.23	0.84	11.54
15MPH	2.38	41.35	467.00	0.64	15.45
30MPH	1.79	14.15	337.27	1.64	28.31
45MPH	1.35	9.55	346.27	4.70	24.28
60MPH	1.40	12.02	410.17	9.00	20.47

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IS MI/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 77
FY75 Emission Factor Program
Model Emission For St. Louis 1973 Model Year Cars (27 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL
	----------GM/MI----------				FE(MI/GAL)
1	5.26	88.99	1031.04	7.63	7.47
2	1.83	40.01	381.09	0.75	19.73
3	5.89	135.44	1059.24	2.33	6.48
4	2.66	45.04	716.66	3.98	11.15
5	2.04	21.68	583.99	6.67	14.21
6	1.62	12.22	262.72	1.68	30.92
7	3.66	79.02	737.83	8.97	10.16
8	2.14	12.66	294.47	3.15	27.64
9	1.62	10.29	612.79	8.79	13.72
10	2.52	10.46	265.43	2.12	29.65
11	3.08	65.43	760.52	10.44	10.17
12	3.87	20.35	285.08	2.42	28.95
13	3.05	50.23	755.62	9.64	10.40
14	2.22	14.38	306.79	2.75	28.48
15	1.61	28.13	354.59	0.77	21.47
16	4.26	124.92	765.30	0.75	9.10
17	3.52	57.52	762.58	8.19	10.27
18	1.38	20.26	315.81	1.74	25.10
19	2.68	42.82	651.94	6.93	12.20
20	2.57	27.10	363.75	1.92	21.41
21	4.78	112.13	784.30	8.95	9.10
22	3.25	21.90	333.41	2.79	23.47
23	4.18	74.61	811.04	5.84	9.83
24	1.83	24.65	547.71	7.01	14.99
25	2.00	14.29	362.54	3.79	22.89
26	2.37	43.77	537.47	1.11	14.46
27	2.50	39.40	651.07	8.39	12.31
28	2.75	21.47	366.15	2.94	21.72
29	3.52	69.42	670.82	3.98	11.22
30	2.14	37.49	556.52	6.57	14.26
31	1.79	15.66	393.36	4.30	20.35
32	2.34	44.45	475.00	0.97	15.07
BAG	2.47	35.44	499.70	5.35	15.74
0MPH	0.53	10.40	78.40	0.05	93.59
5MPH	5.43	174.43	996.15	0.63	6.43
10MPH	3.48	74.43	653.57	0.60	11.36
15MPH	2.33	45.60	449.28	0.48	15.35
30MPH	1.25	15.63	364.88	1.01	22.56
45MPH	0.36	8.37	386.08	2.80	22.06
60MPH	1.07	10.41	443.68	5.96	19.15

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IS MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 78
FY75 Emission Factor Program
Model Emissions For St, Louis 1974 Model Year Cars (26 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	7.35	77.31	1005.69	7.58	7.71
2	3.17	34.69	368.87	0.77	20.48
3	8.61	132.70	1088.85	2.37	6.70
4	3.39	35.74	707.81	3.90	11.46
5	2.74	18.48	601.52	5.83	13.88
6	2.00	11.44	251.80	1.52	32.14
7	4.81	88.27	736.40	8.04	9.97
8	2.41	11.63	287.76	2.93	28.29
9	2.67	22.62	606.77	7.94	13.64
10	3.45	14.95	254.72	2.04	30.69
11	4.42	63.45	765.06	10.03	10.10
12	4.64	20.00	275.97	2.34	27.55
13	4.56	57.07	764.98	9.86	10.21
14	2.98	13.48	285.82	2.78	28.05
15	1.84	21.90	329.70	0.80	23.99
16	5.23	103.39	628.30	0.52	10.99
17	4.53	47.18	771.37	8.13	10.32
18	2.66	16.89	298.18	1.70	26.64
19	3.31	38.40	674.00	6.09	11.92
20	3.63	24.12	340.25	1.78	22.78
21	5.89	119.57	802.45	8.48	8.80
22	4.25	20.98	315.43	2.79	24.53
23	5.27	66.25	830.20	5.25	9.33
24	2.55	25.26	563.15	6.52	14.53
25	2.60	13.75	352.98	3.93	23.18
26	3.08	34.53	512.09	1.28	15.41
27	3.51	36.59	662.27	8.37	12.14
28	3.97	20.18	347.82	3.07	22.63
29	4.73	63.44	671.63	3.52	11.29
30	2.90	38.24	555.93	6.45	14.20
31	2.61	15.80	371.45	4.26	21.94
32	3.37	35.75	459.31	1.14	16.87
BAG	3.55	34.11	496.20	5.27	15.82
0MPH	0.98	15.28	74.16	0.07	87.63
5MPH	10.50	164.92	941.93	0.79	7.19
10MPH	4.14	74.69	596.84	0.56	12.20
15MPH	2.79	45.50	446.03	0.47	16.86
30MPH	1.72	13.79	352.48	1.03	23.38
45MPH	1.55	7.93	372.48	2.90	22.77
60MPH	1.87	10.79	432.28	5.77	19.50

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 79
FY75 Emission Factor Program
Model Emission For St. Louis 1975 Model Year Cars (27 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	2.46	54.29	1127.29	6.11	7.22
2	1.05	16.96	413.63	0.95	19.37
3	3.44	84.70	1189.99	2.35	5.65
4	1.43	23.76	752.55	3.05	11.17
5	0.93	11.26	634.34	4.08	13.55
6	0.72	5.06	274.42	1.05	31.18
7	2.46	66.46	797.81	6.40	9.75
8	0.58	3.87	314.50	2.04	27.53
9	0.69	2.87	656.73	5.24	13.19
10	0.95	7.05	284.14	1.33	29.75
11	1.56	41.56	835.15	7.87	9.80
12	1.31	6.76	293.63	1.50	28.49
13	1.57	32.66	847.07	7.45	9.82
14	0.73	5.60	321.70	1.74	28.67
15	0.64	14.58	345.98	1.02	23.93
16	2.41	63.97	775.91	0.91	10.04
17	1.70	36.50	837.49	6.05	9.86
18	0.49	10.42	332.20	1.1[illegible]	25.26
19	1.36	23.91	732.59	4.77	11.34
20	1.38	14.82	373.11	1.24	22.15
21	2.45	74.18	877.62	7.27	8.86
22	1.25	10.05	358.09	1.67	23.49
23	2.04	49.21	895.04	4.44	9.07
24	0.90	16.47	509.15	4.85	14.36
25	0.63	6.16	372.51	2.32	23.10
26	1.08	25.92	516.27	1.33	15.84
27	1.21	24.67	710.01	6.02	11.79
28	1.12	11.11	373.67	1.83	22.49
29	2.00	46.13	735.21	2.95	10.90
30	1.30	25.34	601.25	4.65	13.76
31	0.60	6.68	396.13	2.65	21.73
32	1.22	27.31	482.98	1.31	16.75
BAG	1.13	20.48	530.07	3.75	15.69
0MPH	0.36	7.85	84.67	0.01	30.43
5MPH	4.41	85.94	1110.41	0.87	7.05
10MPH	2.11	37.79	658.38	0.62	12.25
15MPH	1.07	21.20	496.23	0.52	16.65
30MPH	0.52	7.19	372.42	1.12	23.03
45MPH	0.33	4.58	393.48	1.67	22.09
60MPH	0.25	3.41	454.24	3.73	19.28

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 80
FY75 Emission Factor Program
Model Emissions for St. Louis 1976 Model Year Cars (32 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	2.58	43.99	964.92	5.46	8.52
2	1.23	13.29	360.60	0.91	23.03
3	3.12	56.05	986.92	2.58	8.18
4	1.25	16.61	646.15	2.89	13.13
5	0.76	7.71	586.76	3.81	14.76
6	0.68	4.05	258.92	0.93	33.18
7	1.72	87.52	710.26	5.53	10.40
8	0.57	3.99	296.00	1.99	29.19
9	0.64	10.37	592.76	5.16	14.52
10	1.05	5.13	261.41	1.27	32.54
11	1.31	47.83	776.65	6.61	10.37
12	1.30	6.90	292.96	1.58	28.82
13	1.21	36.14	792.26	6.63	10.41
14	0.77	4.23	303.23	1.68	28.42
15	0.56	6.65	322.40	0.91	26.52
16	1.94	39.55	671.61	1.02	12.00
17	1.50	30.41	774.43	5.32	10.73
18	0.94	6.49	315.67	1.05	26.99
19	1.15	22.88	670.20	4.35	12.50
20	1.35	9.17	363.11	1.26	23.25
21	2.27	102.45	789.69	5.74	9.27
22	1.31	7.54	330.91	1.70	25.58
23	1.81	34.02	777.79	4.16	10.60
24	0.67	12.95	549.80	3.94	15.51
25	0.58	5.10	363.58	2.41	23.77
26	0.81	12.24	491.77	1.32	17.28
27	0.97	19.84	671.81	5.23	12.57
28	1.24	8.21	354.11	1.94	23.93
29	1.72	32.67	645.86	2.53	12.63
30	0.94	28.00	542.23	3.64	15.06
31	0.59	6.33	388.25	2.75	22.18
32	1.01	13.25	443.53	1.17	18.98
BAG	1.07	19.68	488.56	3.51	16.97
0MPH	0.54	8.75	68.36	0.09	105.89
5MPH	7.51	121.84	827.12	0.82	8.51
10MPH	3.41	49.60	536.06	0.47	14.21
15MPH	1.69	27.52	401.35	0.55	19.73
30MPH	0.57	4.68	335.58	0.99	25.75
45MPH	0.43	2.49	363.30	1.58	24.08
60MPH	0.32	3.70	422.89	3.55	20.65

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 81
FY75 Emission Factor Program
Model Emissions For St. Louis 1975 and 1976 Light Duty Trucks (13 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL
	----------GM/M----------				MPG
1	2.33	44.51	1177.98	6.81	7.07
2	0.90	15.01	443.88	0.65	18.81
3	2.38	65.30	1169.99	2.51	7.42
4	1.23	23.77	770.23	3.45	10.94
5	0.83	11.64	700.76	5.17	12.30
6	1.38	5.23	319.48	0.85	26.73
7	1.95	73.03	869.77	7.80	8.96
8	1.35	6.15	369.34	1.62	23.16
9	0.70	12.80	707.08	7.05	12.17
10	1.33	7.82	321.67	1.02	26.25
11	1.25	32.80	905.74	8.93	9.23
12	1.88	16.07	331.69	1.23	25.11
13	1.22	31.00	884.21	8.64	9.47
14	1.31	6.53	362.94	1.51	23.23
15	0.60	12.47	407.21	0.84	20.70
16	1.46	42.09	839.87	0.58	9.75
17	1.34	25.11	866.42	7.35	9.75
18	1.22	9.52	377.68	0.96	22.48
19	1.61	31.84	754.19	5.51	10.97
20	1.39	12.83	442.22	1.05	19.01
21	2.12	80.33	930.64	8.21	8.34
22	1.67	12.74	407.19	1.51	20.52
23	1.57	29.96	896.63	4.92	9.36
24	0.75	11.60	642.24	5.66	13.39
25	1.21	11.99	431.69	2.03	19.53
26	0.90	15.61	616.23	1.29	13.79
27	0.94	16.14	760.58	6.77	11.25
28	1.43	13.53	434.90	1.55	19.27
29	1.37	23.62	735.58	3.41	11.42
30	0.91	17.38	638.45	5.75	13.27
31	1.16	13.76	478.07	2.23	17.63
32	0.92	16.88	555.89	1.06	15.16
BAG	1.14	19.93	576.65	3.90	14.51
0MPH	0.24	6.02	87.17	0.05	91.11
5MPH	3.23	73.45	1073.44	0.62	7.40
10MPH	1.81	32.67	637.31	0.44	12.79
15MPH	1.01	23.20	525.73	0.50	15.70
30MPH	0.59	9.31	423.08	0.77	20.19
45MPH	0.35	4.50	442.15	1.57	19.71
60MPH	0.44	11.69	496.66	3.31	17.19

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 82
FY75 Emission Factor Program
Model Emissions For Washington 1976 Model Year Cars (34 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	1.35	23.48	900.37	6.86	9.43
2	0.37	5.49	410.61	1.09	21.11
3	1.54	40.53	941.04	3.72	8.79
4	0.57	8.36	595.79	3.83	14.53
5	0.40	3.32	522.86	4.73	16.74
6	0.22	1.74	292.34	0.93	30.01
7	1.13	52.46	660.66	5.80	11.89
8	0.19	1.93	346.95	1.90	25.32
9	0.44	13.92	531.14	5.75	16.01
10	0.39	2.64	297.44	1.24	29.31
11	1.04	51.70	725.39	6.39	10.96
12	0.48	3.15	339.84	1.51	25.53
13	0.93	40.27	730.10	6.67	11.15
14	0.22	1.76	329.91	1.53	26.82
15	0.20	3.96	363.88	1.27	23.94
16	0.74	26.08	763.59	1.43	11.09
17	0.86	18.52	719.43	5.90	11.81
18	0.24	2.99	339.02	1.03	25.76
19	0.62	13.96	579.46	4.95	14.71
20	0.43	4.47	396.12	1.15	21.94
21	1.68	72.70	752.51	5.96	10.19
22	0.48	3.73	375.02	1.69	23.21
23	0.85	19.43	698.11	5.00	12.14
24	0.43	11.54	569.49	4.78	15.78
25	0.17	2.21	392.32	2.12	22.39
26	0.32	5.62	543.17	2.10	16.05
27	0.64	17.87	622.52	5.65	13.50
28	0.46	3.24	393.80	1.74	22.17
29	0.88	20.04	595.24	3.82	14.10
30	0.59	14.95	492.43	4.44	16.88
31	0.19	2.95	428.84	2.43	20.45
32	0.34	6.52	504.98	1.77	17.19
BAG	0.59	15.07	501.85	3.54	16.83
0MPH	0.17	3.08	82.53	0.13	100.96
5MPH	2.27	38.66	1002.63	1.62	8.29
10MPH	0.94	12.36	631.90	0.93	13.56
15MPH	0.56	6.45	447.31	0.77	19.33
30MPH	0.30	0.80	357.02	1.38	24.71
45MPH	0.18	0.68	371.18	1.71	23.81
60MPH	0.14	0.79	429.04	3.54	20.61

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

Table 83
FY75 Emission Factor Program
Model Emission For Washington 1976 Model Year Light Duty Trucks (10 Vehicles)

MODE NO.	HC	CO	CO2	NOX	FUEL ECON
	----------GM/MI----------				
1	1.26	20.14	987.69	6.02	8.57
2	0.42	4.87	471.49	0.84	18.47
3	1.46	30.30	1053.06	2.91	8.03
4	0.62	7.77	679.38	3.16	12.80
5	0.45	3.31	606.47	4.23	14.49
6	0.45	1.63	339.88	0.75	25.81
7	0.92	23.20	743.13	7.17	11.34
8	0.45	2.20	378.81	1.73	23.13
9	0.41	5.32	619.97	5.61	14.10
10	0.83	2.74	341.76	1.11	25.45
11	0.84	24.12	704.20	7.95	10.63
12	1.05	3.03	373.85	1.45	23.15
13	0.68	13.02	782.19	8.33	11.03
14	0.49	2.85	367.27	1.63	23.73
15	0.26	2.51	432.29	1.03	20.31
16	0.77	16.86	889.69	1.16	9.66
17	0.44	14.83	757.58	5.43	11.24
18	0.53	2.21	382.62	0.83	22.87
19	0.71	14.21	624.83	4.36	13.57
20	0.77	3.88	453.20	0.91	19.22
21	1.10	39.73	823.73	7.51	9.38
22	0.93	3.95	414.74	1.61	20.44
23	0.88	15.81	743.30	4.06	11.51
24	0.40	4.34	551.52	4.84	15.86
25	0.40	3.05	433.72	2.04	20.19
26	0.40	4.36	662.63	1.59	13.23
27	0.58	4.96	664.38	6.12	13.02
28	0.46	4.02	433.84	1.70	20.04
29	0.75	13.73	641.74	3.10	13.33
30	0.53	3.87	566.12	5.09	15.26
31	0.33	4.39	475.18	2.24	18.37
32	0.46	5.69	564.86	1.41	15.43
AVG	0.55	8.44	555.01	3.73	15.56
0MPH	0.14	2.51	100.88	0.15	84.42
5MPH	2.01	28.31	1216.29	1.40	7.00
10MPH	1.16	11.66	687.51	0.92	12.51
15MPH	0.56	6.42	524.75	0.74	16.53
30MPH	0.30	1.29	418.40	1.30	21.06
45MPH	0.25	1.28	429.35	1.36	20.54
60MPH	0.24	3.44	481.96	3.24	18.18

FUEL ECONOMY IN MI/GAL EXCEPT 0 MPH IN MIN/GAL.
EMISSIONS IN GM/MIN FOR 0 MPH.

TABLE 84

FY 75 EMISSION FACTOR PROGRAM

Fuel Evaporative Emissions Using the Enclosure Technique

1976 Model Year Cars in Denver and Los Angeles

		Diurnal Loss GMS		Hot Soak Loss GMS		Combined* Loss GMS/MI	
City	N	Mean	SD	Mean	SD	Mean	SD
Denver	20	21.74	13.06	10.46	6.20	1.91	.93
Los Angeles	20	7.76	6.65	5.40	4.09	.87	.48

* Combined HC evaporative loss in gm/mi = (diurnal loss + (# trips per day X hot soak loss)) divided by # miles per day
with 3.3 trips per day and 29.4 miles per day

TABLE 85

Results of Sulfate Emissions Testing*
1976 Model Year Cars with Air Pumps

Location	N	HC GM/MI Mean	HC GM/MI S.D.	CO GM/MI Mean	CO GM/MI S.D.	NOX GM/MI Mean	NOX GM/MI S.D.	Fuel Economy MPG Mean	Fuel Economy MPG S.D.	H2SO4 MG/MI Mean	H2SO4 MG/MI S.D.
Denver	9	.48	.13	23.74	11.97	1.12	.48	17.42	4.11	2.88	2.22
Houston	8	.60	.67	2.38	3.40	2.67	.79	17.35	2.81	15.73	17.72
St. Louis	9	.39	.25	4.64	7.92	3.15	2.03	19.11	4.27	2.20	2.54
Phoenix	43	.40	.26	3.44	3.80	2.41	.89	18.18	3.99	14.98	37.05
Composite+	60	.42	.34	3.48	4.53	2.56	1.13	18.20	3.90	13.17	32.20
1976 Model Year Cars without Air Pumps											
Denver	19	2.42	1.06	60.99	22.63	1.87	.86	17.53	2.84	2.39	3.77
Houston	18	.69	.61	11.40	11.36	3.07	1.36	17.99	3.48	2.41	1.99
St. Louis	36	1.06	.74	22.07	17.20	3.53	1.95	18.31	3.03	.42	.47
Phoenix	77	.48	.53	8.31	8.65	2.97	1.18	18.61	3.04	4.08	10.96
Composite+	131	.67	.65	12.52	13.27	3.14	1.46	18.45	3.02	2.85	8.56

*Although no specific malperformance has yet been located, the nature of the St. Louis sulfate data is considered suspicious at EPA.
+All vehicles excluding Denver vehicles

TABLE .86

Results of Sulfate Emissions Testing*
1975 Model Year Cars with Air Pumps

Location	N	HC GM/MI Mean	HC GM/MI S.D.	CO GM/MI Mean	CO GM/MI S.D.	NOX GM/MI Mean	NOX GM/MI S.D.	Fuel Economy MPG Mean	Fuel Economy MPG S.D.	H_2SO_4 MG/MI Mean	H_2SO_4 MG/MI S.D.
Denver	8	.51	.22	21.71	11.90	1.52	.77	16.81	4.41	3.36	3.68
Houston	7	.64	.32	8.01	10.09	2.59	1.24	15.35	3.10	9.36	7.12
St. Louis	10	1.01	1.56	8.70	9.78	3.54	1.31	17.18	2.99	1.78	2.00
Phoenix	16	.45	.45	4.34	6.11	3.30	1.37	18.31	4.16	10.09	8.42
Composite+	33	.66	.93	6.44	8.24	3.22	1.33	17.26	3.66	7.42	7.63
1975 Model Year Cars without Air Pumps											
Denver	15	2.21	.75	63.13	27.52	1.73	.55	17.11	3.15	.56	.55
Houston	14	.97	1.04	22.49	26.67	3.56	1.56	16.79	3.78	6.09	14.18
St. Louis	18	1.08	.71	22.27	15.26	3.22	1.49	18.49	3.17	.33	.36
Phoenix	19	.74	.53	17.12	13.83	2.87	1.01	17.26	3.39	1.64	1.43
Composite+	51	.92	.76	20.41	18.42	3.18	1.35	17.54	3.48	2.40	7.66

* Although no specific malperformance has yet been located, the nature of the St. Louis sulfate data is considered suspicious at EPA.
+ All vehicles excluding Denver vehicles

TABLE 87

Results of Sulfate Emissions Testing*
1975 and 1976 Light Duty Trucks with Air Pumps

Location	N	HC GM/MI Mean	HC GM/MI S.D.	CO GM/MI Mean	CO GM/MI S.D.	NOX GM/MI Mean	NOX GM/MI S.D.	Fuel Economy MPG Mean	Fuel Economy MPG S.D.	H_2SO_4 MG/MI Mean	H_2SO_4 MG/MI S.D.
Denver	8	.69	.46	22.74	25.41	1.75	.75	16.04	2.19	2.20	1.53
Houston	8	1.03	1.44	4.79	5.11	2.86	1.07	17.99	3.48	3.21	3.69
St. Louis	2	.34	.05	3.49	.47	1.86	.01	17.61	4.62	.95	.52
Phoenix	0	-	-	-	-	-	-	-	-	-	-
Composite +	10	.89	1.31	4.53	4.54	2.66	1.03	17.91	3.44	2.76	3.40

1975 and 1976 Light Duty Trucks without Air Pumps

Denver	7	2.40	1.00	63.59	28.07	1.81	.48	16.81	1.49	3.21	5.52
Houston	8	1.33	1.18	24.60	22.95	3.54	1.57	16.28	2.24	2.15	1.18
St. Louis	3	.56	.25	15.63	13.34	3.10	.90	16.46	2.28	1.02	.89
Phoenix	0	-	-	-	-	-	-	-	-	-	-
Composite +	11	1.12	1.06	22.15	20.54	3.42	1.39	16.33	2.14	1.84	1.19

* Although no specific malperformance has yet been located, the nature of the St. Louis sulfate data is considered suspicious at EPA.
+ All vehicles excluding Denver vehicles

Table 89
Contingency Analysis
Federal Short Cycle
Model Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
Fail	n	6	114
	HC	-2.96	74.46
	CO	-1.75	202.73
	NOx	-1.52	15.98
	Total	-6.23	293.17

Short Test

Pass	n	182	98
	HC	-91.84	10.88
	CO	-98.66	23.49
	NOx	-54.18	9.05
	Total	-244.68	43.42

TABLE 88

Short Test/FTP Emission Sample Correlations
for 1975 and 1976 Model Year Cars and for all Model Year Vehicles

Short Test	Cycle	1975 and 1976 Model Year Cars N	HC	CO	NOX	All Vehicles N	HC	CO	NOX
Federal Short Cycle		400	.878	.918	.878	1016	.945	.932	.916
Clayton Key Mode	High	400	.412	.440	.695	1016	.300	.674	.740
	Low	400	.611	.560	.635	1016	.347	.693	.653
	Idle	400	.705	.747	.136	1016	.748	.680	.026*
Two Speed Idle	High	400	.554	.583	.608	1016	.633	.646	.526
	Low	400	.602	.743	.213	1016	.633	.669	.070*
Federal 3 Mode	High	400	.477	.404	.632	1016	.832	.638	.650
	Low	400	.550	.494	.674	1016	.850	.635	.673
	Idle	400	.587	.716	.207	1016	.625	.659	.029*
New York-New Jersey		253	.868	.855	.772	619	.910	.856	.822
New York City		50	.831	.832	.921	149	.856	.903	.904
Revised Federal 3 Mode	High	147	.672	.520	.758	397	.718	.751	.720
	Low	147	.724	.651	.699	397	.813	.768	.646
	Idle	147	.682	.753	.257	397	.541	.665	.219

*Indicates the computed sample correlation was not significantly greater than zero at the nominal .01 level.

Table 90
Contingency Analysis
New Jersey Acid and New York Short Composite
Model Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
	n	8	68
	HC	-3.75	52.10
Fail	CO	-4.02	142.84
	NOx	-2.69	7.07
	Total	-10.45	202.01

Short Test

	n	108	69
	HC	-54.95	7.80
Pass	CO	-55.91	22.40
	NOx	-30.53	7.14
	Total	-141.39	37.35

Table 91
Contingency Analysis
Clayton Key Mode
Model Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
	n	12	103
	HC	-4.27	72.19
Fail	CO	-3.48	194.39
	NOx	-3.25	12.97
	Total	-11.00	279.55

Short Test

	n	176	104
	HC	-90.53	13.15
Pass	CO	-96.93	31.83
	NOx	-52.45	12.07
	Total	-239.91	57.05

Table 92
Contingency Analysis
Two Speed Idle
Model Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
	n	14	106
	HC	-5.71	71.39
Fail	CO	-5.98	187.21
	NOx	-4.27	11.73
	Total	-15.94	270.39

Short Test

	n	174	106
	HC	-39.09	13.947
Pass	CO	-94.44	39.01
	NOx	-51.43	13.25
	Total	-234.95	66.20

Table 93
Contingency Analysis
Federal Three Mode
Mode Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
	n	9	111
	HC	-3.93	70.04
Fail	CO	-3.21	188.76
	NOx	-2.97	12.98
	Total	-10.11	271.77

Short Test

	n	179	101
	HC	-90.97	15.30
Pass	CO	-97.21	37.46
	NOx	-52.72	12.06
	Total	-240.79	64.82

Table 94
Contingency Analysis
Revised Federal Three Mode
Model Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
	n	5	40
	HC	-2.27	19.33
Fail	CO	-2.05	49.00
	NOx	-1.32	8.31
	Total	-5.64	76.63

Short Test

	n	67	35
	HC	-33.83	6.11
Pass	CO	-38.44	11.98
	NOx	-21.16	2.52
	Total	-93.43	20.61

Table 95
Contingency Analysis
New York City Cycle
Model Year 1975 and 1976 Vehicles

FTP

		Pass	Fail
Fail	n	0	15
	HC	-	13 97
	CO	-	36.23
	NOx	-	2.87
	Total	-	53.07

Short Test

Pass	n	16	19
	HC	- 7.89	4.42
	CO	- 9.01	8.24
	NOx	- 5.06	2.17
	Total	-21.96	14.83

Appendix I

Additional Summary Data from FY75 Emission Factor Program

Appendix I-1
FY75 Emission Factor Program
Emission Results for Chicago
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
64-8	50	77.9	33.87	24.83	28.69	1.72	434.01	217.51	374.27	1.82	13.55	6.67	12.00	1.67
1969	30	62.2	28.46	22.47	24.37	1.63	312.15	157.52	279.22	1.62	18.94	8.85	16.97	1.64
1970	35	57.9	27.07	21.16	22.35	1.79	355.07	223.04	293.94	1.89	14.63	6.58	12.86	1.76
1971	40	55.9	25.85	38.43	18.57	1.86	276.90	182.52	235.77	1.76	17.51	7.02	16.18	1.51
1972	45	42.1	19.18	12.93	16.68	1.63	240.76	134.54	204.11	1.82	18.22	6.70	17.18	1.41
1973	50	34.1	17.22	16.22	14.62	1.62	191.95	106.63	170.30	1.61	13.04	5.52	11.86	1.58
1974	50	24.0	17.53	17.06	14.47	1.70	189.79	121.77	163.21	1.70	13.09	5.79	11.79	1.62
1975	50	15.9	8.68	6.87	7.34	1.69	129.25	97.05	102.79	1.97	11.10	5.17	10.01	1.59
1976	150	7.3	7.18	3.89	6.39	1.61	102.38	73.70	81.42	2.04	11.12	4.24	10.35	1.47
LDT*	17	11.2	8.21	7.15	6.40	2.04	121.61	71.62	106.20	1.68	9.72	3.32	9.23	1.39

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-2

FY75 Emission Factor Program
Emission Results for Chicago
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	77.9	28.17	22.29	23.77	1.71	341.29	195.61	280.46	2.09	10.55	4.66	9.43	1.67
1969	30	62.2	22.87	22.43	18.62	1.71	224.17	126.73	180.12	2.28	14.86	5.95	13.64	1.55
1970	35	57.9	21.96	18.69	18.25	1.72	253.81	142.95	220.43	1.73	10.61	4.51	9.63	1.59
1971	40	55.9	17.44	20.08	14.13	1.72	192.92	108.59	157.84	2.04	12.15	4.98	11.13	1.54
1972	45	42.1	12.73	9.04	11.11	1.62	186.76	136.12	144.86	2.08	11.58	4.14	10.90	1.42
1973	50	34.1	12.70	15.40	10.13	1.77	162.38	121.85	121.41	2.25	8.13	3.23	7.47	1.53
1974	50	24.0	13.87	17.28	10.98	1.72	150.05	117.63	116.28	2.11	8.34	3.95	7.49	1.61
1975	50	15.9	5.56	9.16	2.88	3.20	79.84	111.39	11.50	122.18	6.73	3.32	6.05	1.61
1976	150	7.3	4.23	4.51	2.45	3.04	74.70	106.42	13.60	18.79	7.59	3.38	6.94	1.53
LDT*	17	11.2	3.39	3.75	2.19	2.60	59.61	81.07	4.93	286.89	5.98	2.02	5.66	1.42

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-3
FY75 Emission Factor Program
Emission Results for Chicago
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	77.9	22.26	18.75	18.93	1.64	229.99	139.53	190.57	1.96	15.82	6.70	14.27	1.63
1969	30	62.2	19.84	17.93	15.59	1.67	138.61	63.19	124.18	1.66	21.60	8.50	20.02	1.50
1970	35	57.9	16.88	14.45	14.04	1.71	149.44	88.56	130.25	1.68	17.00	6.77	15.32	1.66
1971	40	55.9	14.03	15.64	11.90	1.54	109.51	52.98	96.26	1.72	19.46	7.07	18.22	1.45
1972	45	42.1	11.12	5.09	10.31	1.45	110.25	67.70	91.96	1.85	19.23	6.92	18.08	1.43
1973	50	34.1	11.33	15.19	9.03	1.72	98.59	56.17	83.80	1.81	13.11	5.15	12.10	1.51
1974	50	24.0	12.77	14.33	10.16	1.75	102.57	75.27	83.97	1.87	13.22	6.37	11.84	1.62
1975	50	15.9	4.60	4.91	3.27	2.27	53.43	63.85	29.29	3.37	10.16	5.23	9.03	1.64
1976	150	7.3	3.86	2.57	3.13	1.96	44.77	50.42	25.42	3.24	10.65	4.08	9.98	1.43
LDT*	17	11.2	3.90	2.74	3.32	1.73	49.01	47.27	30.04	3.06	8.80	2.41	8.45	1.36

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-4

FY75 Emission Factor Program
Emission Results for Denver
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	73.4	29.22	12.41	26.96	1.51	389.04	204.64	350.77	1.69	11.43	5.24	10.25	1.64
1971	22	58.8	36.13	24.04	30.32	1.78	462.81	279.80	407.17	1.63	10.88	4.65	9.51	1.85
1972	25	46.1	23.83	14.50	21.62	1.50	324.32	90.56	311.10	1.36	12.00	3.69	11.44	1.38
1973	27	39.3	22.16	9.74	20.73	1.42	351.29	157.12	316.49	1.63	9.76	4.19	8.76	1.67
1974	27	28.2	20.19	6.04	19.35	1.35	319.62	86.82	308.39	1.32	10.14	5.44	8.99	1.63
1975	28	19.6	12.82	4.80	12.04	1.43	244.55	109.35	219.70	1.65	8.22	3.66	7.44	1.64
1976	34	10.9	12.81	4.77	12.00	1.44	241.95	109.09	217.43	1.64	8.01	3.72	7.18	1.63
LDT*	17	13.7	12.83	6.11	11.57	1.60	218.07	102.51	196.67	1.61	8.85	3.46	8.28	1.45

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-5
FY75 Emission Factor Program
Emission Results for Denver
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	73.4	22.22	8.68	20.76	1.45	325.33	155.32	283.03	1.81	8.49	3.09	7.94	1.47
1971	22	58.8	25.27	14.94	22.39	1.60	358.72	238.09	301.98	1.85	7.75	3.11	7.04	1.63
1972	25	46.1	21.66	17.48	18.31	1.69	277.07	112.11	253.02	1.59	8.15	3.23	7.57	1.48
1973	27	39.3	17.03	7.15	15.68	1.52	317.62	163.56	273.96	1.81	6.65	3.80	5.84	1.67
1974	27	28.2	17.33	7.20	15.88	1.55	324.99	133.44	297.10	1.57	5.92	3.38	5.19	1.66
1975	28	19.6	7.85	5.27	5.75	2.48	168.06	124.86	97.86	4.45	5.58	2.06	5.17	1.53
1976	34	10.9	7.60	5.53	5.65	2.30	150.13	117.01	87.15	3.94	5.80	2.32	5.40	1.46
LDT*	17	13.7	6.72	4.85	5.29	2.06	130.39	105.05	67.08	5.34	5.07	2.22	4.62	1.58

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-6
FY75 Emission Factor Program
Emission Results for Denver
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	73.4	18.64	5.95	17.76	1.38	251.46	113.07	225.98	1.64	12.34	4.13	11.63	1.45
1971	22	58.8	19.31	7.72	18.21	1.39	263.85	168.48	228.86	1.69	12.12	4.91	10.78	1.78
1972	25	46.1	18.34	8.89	16.92	1.47	211.64	66.50	201.24	1.39	12.68	4.56	11.88	1.45
1973	27	39.3	15.36	4.84	14.62	1.38	259.07	124.88	231.39	1.64	9.89	5.04	8.69	1.71
1974	27	28.2	15.44	4.90	14.67	1.39	260.01	95.72	244.81	1.42	8.71	4.88	7.54	1.72
1975	28	19.6	7.76	3.65	6.88	1.70	150.43	90.65	122.59	2.17	7.85	3.37	7.12	1.66
1976	34	10.9	7.80	3.73	7.02	1.59	147.41	73.60	123.57	2.00	7.70	3.39	7.04	1.54
LDT*	17	13.7	7.23	3.44	6.48	1.63	130.71	80.83	102.85	2.26	8.00	3.21	7.48	1.45

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-7

FY75 Emission Factor Program
Emission Results for Houston
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	51.6	24.39	26.02	18.52	1.94	270.72	184.25	215.57	2.07	12.31	5.33	11.17	1.61
1974	27	35.6	17.77	6.87	16.61	1.45	264.69	134.32	238.09	1.58	12.40	6.17	10.91	1.71
1975	28	28.5	9.22	3.40	8.62	1.46	151.01	91.06	128.68	1.79	11.86	4.56	11.07	1.46
1976	34	11.5	9.32	7.03	7.94	1.69	113.08	74.55	87.99	2.20	12.59	5.12	11.69	1.48
LDT*	17	18.4	11.60	7.21	9.76	1.82	148.26	122.16	101.20	2.68	12.86	5.07	11.97	1.48

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-8
FY75 Emission Factor Program
Emission Results for Houston
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	51.6	18.20	23.13	13.38	1.96	254.96	189.30	199.38	2.05	7.73	3.79	6.95	1.60
1974	27	35.6	16.46	9.26	14.46	1.67	273.74	207.82	210.24	2.14	7.19	3.94	6.29	1.70
1975	28	28.5	6.84	5.43	5.21	2.25	138.54	160.86	66.78	5.23	7.45	3.64	6.80	1.52
1976	34	11.5	6.12	5.33	4.01	2.75	78.92	94.70	19.22	8.97	8.70	4.05	7.87	1.58
LDT*	17	18.4	10.19	11.05	5.88	3.04	167.97	227.72	42.19	9.13	8.40	2.99	7.90	1.45

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-9
FY75 Emission Factor Program
Emission Results for Houston
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	51.6	15.86	19.97	11.57	1.96	143.09	106.90	111.64	2.05	12.00	4.65	11.21	1.46
1974	27	35.6	12.84	5.33	11.84	1.51	166.36	99.59	140.34	1.82	11.87	6.23	10.44	1.69
1975	28	28.5	5.82	3.81	5.00	1.75	76.12	89.14	52.91	2.37	11.59	5.38	10.47	1.59
1976	34	11.5	5.68	3.59	4.75	1.85	50.03	53.55	27.65	3.30	11.54	4.90	10.74	1.45
LDT*	17	18.4	8.30	5.88	6.85	1.84	87.92	99.91	43.95	3.83	13.29	5.51	12.20	1.54

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-10
FY75 Emission Factor Program
Emission Results for Los Angeles
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	75.9	33.31	55.09	22.86	1.93	263.14	133.56	223.64	1.92	19.33	5.60	18.55	1.35
1971	22	68.9	38.12	54.70	22.68	2.41	341.58	246.50	258.29	2.29	16.44	6.07	15.13	1.58
1972	25	58.7	18.30	17.26	15.18	1.71	219.47	111.78	190.96	1.76	15.03	5.05	14.17	1.43
1973	27	47.5	19.76	23.11	15.89	1.70	218.22	89.89	201.84	1.50	14.99	8.60	13.08	1.68
1974	27	32.0	23.48	28.50	16.92	1.98	225.89	136.79	198.25	1.66	10.62	6.47	8.93	1.82
1975	28	16.2	5.85	2.92	5.12	1.72	87.66	78.11	65.95	2.09	8.96	5.60	7.66	1.77
1976	34	8.7	7.01	6.36	5.65	1.83	96.56	88.28	73.50	2.09	7.26	2.86	6.71	1.54
LDT*	17	14.1	6.94	4.09	5.87	1.85	111.33	110.23	77.39	2.30	8.60	4.70	7.60	1.66

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-11
FY75 Emission Factor Program
Emission Results for Los Angeles
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	75.9	19.75	13.19	17.12	1.66	224.28	168.48	181.37	1.93	13.15	4.95	12.43	1.39
1971	22	68.9	34.78	52.79	19.58	2.54	317.27	297.35	210.38	2.72	10.75	5.32	9.45	1.77
1972	25	58.7	10.24	4.58	9.21	1.64	164.16	96.70	135.95	1.93	9.03	3.00	8.56	1.40
1973	27	47.5	16.49	22.01	12.49	1.82	203.98	129.19	165.17	2.05	9.45	4.98	8.20	1.75
1974	27	32.0	17.95	27.47	10.92	2.41	151.20	87.29	127.11	1.88	6.39	3.55	5.57	1.71
1975	28	16.2	1.36	1.01	1.02	2.24	12.96	21.20	1.83	63.89	6.16	3.28	5.52	1.59
1976	34	8.7	1.32	0.99	1.08	1.86	10.63	25.21	1.77	42.51	4.80	2.28	4.45	1.45
LDT*	17	14.1	3.54	4.03	2.09	2.94	65.76	123.77	10.91	9.17	6.25	3.75	5.32	1.79

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-12
FY75 Emission Factor Program
Emission Results for Los Angeles
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	75.9	13.73	4.99	12.88	1.45	116.46	82.44	97.41	1.82	21.03	6.97	19.94	1.41
1971	22	68.9	27.11	42.21	15.60	2.44	182.45	143.42	137.31	2.18	17.01	6.57	15.76	1.51
1972	25	58.7	9.78	3.38	9.17	1.47	101.82	45.96	91.56	1.63	16.20	6.55	15.03	1.48
1973	27	47.5	13.81	17.67	10.71	1.77	117.11	75.01	96.60	1.91	15.02	7.47	13.31	1.67
1974	27	32.0	14.47	19.42	10.53	1.95	106.34	49.65	94.60	1.67	9.71	5.73	8.31	1.76
1975	28	16.2	2.13	1.47	1.78	1.82	15.00	14.25	10.14	2.47	8.67	5.26	7.64	1.62
1976	34	8.7	1.83	0.81	1.64	1.62	13.17	12.31	9.11	2.50	6.71	2.73	6.33	1.39
LDT*	17	14.1	3.63	3.04	2.91	1.90	47.34	71.08	25.59	2.76	7.97	4.88	6.83	1.76

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-13
FY75 Emission Factor Program
Emission Results for St. Louis
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	84.9	41.09	37.27	32.86	1.82	534.46	319.85	443.26	1.94	15.16	10.44	11.81	2.17
1969	30	84.3	27.38	26.02	22.39	1.76	356.80	206.44	303.64	1.81	17.98	7.60	16.21	1.64
1970	34	65.5	29.35	30.50	23.18	1.83	420.05	289.76	349.82	1.83	15.76	6.46	13.84	1.86
1971	40	66.3	25.03	22.25	20.38	1.78	316.13	193.75	276.35	1.67	17.42	6.50	15.83	1.65
1972	45	58.5	21.15	20.76	17.68	1.65	263.22	143.48	227.87	1.74	21.49	8.27	19.97	1.48
1973	50	45.3	17.05	6.38	15.98	1.44	245.91	111.94	225.17	1.53	15.27	6.32	14.01	1.54
1974	50	35.8	19.87	13.78	17.37	1.59	265.05	194.34	218.12	1.82	14.63	6.91	13.05	1.64
1975	48	23.9	11.07	7.15	9.59	1.67	178.37	243.34	126.03	2.15	11.94	5.83	10.65	1.66
1976	146	16.1	8.94	4.04	8.08	1.60	120.69	79.96	97.06	2.02	12.49	6.06	11.17	1.63
LDT*	13	15.0	12.43	7.85	10.52	1.83	208.62	158.53	167.80	1.97	12.19	5.75	11.13	1.55

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-14
FY75 Emission Factor Program
Emission Results for St. Louis
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	84.9	35.97	33.13	27.69	1.95	464.34	319.21	370.52	2.02	10.62	6.94	8.44	2.06
1969	30	84.3	22.40	25.09	17.71	1.81	289.61	183.90	233.27	2.01	12.79	5.68	11.46	1.66
1970	34	65.5	24.76	23.97	19.45	1.86	338.45	305.87	255.39	2.10	11.02	4.17	10.08	1.61
1971	40	66.3	22.57	25.74	16.74	1.99	275.79	210.53	214.43	2.12	11.99	4.92	10.64	1.77
1972	45	58.5	15.66	12.70	13.46	1.65	240.02	189.06	187.85	2.10	13.75	5.86	12.55	1.55
1973	50	45.3	12.92	5.82	11.69	1.58	209.65	121.31	166.43	2.19	9.59	4.25	8.72	1.57
1974	50	35.8	15.55	10.91	13.36	1.69	255.59	202.63	187.56	2.32	8.60	4.69	7.57	1.67
1975	48	23.9	6.04	6.29	4.00	2.52	131.23	247.27	42.46	6.28	8.43	4.23	7.50	1.65
1976	146	16.1	5.02	4.36	3.39	2.60	80.34	101.68	18.92	24.56	7.94	4.60	7.02	1.62
LDT*	13	15.0	5.09	4.35	3.59	2.39	115.46	121.47	49.85	5.55	6.92	3.05	6.42	1.48

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-15
FY75 Emission Factor Program
Emission Results for St. Louis
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	84.9	27.32	26.23	21.94	1.78	288.51	199.81	230.51	2.02	16.48	9.46	13.71	1.92
1969	30	84.3	18.76	18.95	15.35	1.71	165.22	93.56	138.25	1.89	19.78	8.37	18.00	1.58
1970	34	65.5	15.31	6.30	14.30	1.43	169.14	115.67	139.18	1.88	18.39	6.04	17.32	1.45
1971	40	66.3	17.85	18.84	14.13	1.80	157.56	153.12	122.02	1.99	18.64	7.17	16.52	1.83
1972	45	58.5	12.95	6.25	12.06	1.42	133.40	100.71	110.24	1.85	22.75	7.69	21.44	1.43
1973	50	45.3	11.52	4.52	10.74	1.46	122.18	60.30	105.86	1.79	16.07	6.81	14.73	1.53
1974	50	35.8	13.65	9.33	12.10	1.55	147.53	126.75	114.80	1.99	14.47	6.86	12.88	1.65
1975	48	23.9	5.21	4.87	4.04	1.98	87.82	224.50	40.39	3.01	11.38	5.25	10.20	1.66
1976	146	16.1	4.51	2.75	3.73	1.91	52.05	50.60	31.25	3.14	11.23	5.74	10.14	1.56
LDT*	13	15.0	5.23	3.40	4.33	1.90	77.99	59.16	55.44	2.52	11.51	5.05	10.77	1.43

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-16
FY75 Emission Factor Program
Emission Results for Washington
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	46.6	15.83	10.96	13.99	1.57	241.91	195.80	199.15	1.82	13.30	5.12	12.18	1.59
1974	27	28.8	15.31	6.23	14.29	1.45	217.41	144.38	187.51	1.67	14.36	7.50	12.56	1.72
1975	28	19.2	9.29	6.66	7.84	1.74	138.88	95.58	112.96	1.94	12.10	5.67	10.94	1.59
1976	34	4.8	6.25	2.53	5.78	1.50	83.84	44.36	71.51	1.84	11.87	4.99	10.97	1.49
LDT*	17	9.4	6.25	3.05	5.52	1.71	99.99	83.30	72.05	2.57	11.73	4.64	10.97	1.45

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-17
FY75 Emission Factor Program
Emission Results for Washington
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	46.6	11.08	4.75	9.84	1.73	192.07	128.94	141.10	2.50	9.56	3.81	8.82	1.53
1974	27	28.8	12.00	4.69	11.17	1.48	160.76	102.77	126.72	2.20	9.37	4.87	8.28	1.66
1975	28	19.2	5.42	5.40	3.27	2.99	87.06	94.58	29.49	7.40	8.40	4.93	7.45	1.61
1976	34	4.8	2.62	2.97	1.67	2.51	36.31	66.03	4.26	60.41	9.19	3.95	8.51	1.47
LDT*	17	9.4	3.10	2.95	1.92	2.79	44.13	49.59	16.81	6.66	7.40	3.10	6.82	1.52

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-18
FY75 Emission Factor Program
Emission Results for Washington
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	46.6	9.99	3.28	9.52	1.37	119.48	68.87	99.86	1.91	14.19	5.69	13.05	1.54
1974	27	28.8	9.88	2.82	9.45	1.37	101.19	75.11	82.82	1.93	13.90	6.46	12.44	1.66
1975	28	19.2	4.54	3.38	3.49	2.11	51.26	59.52	28.58	3.21	11.90	6.81	10.43	1.68
1976	34	4.8	2.99	1.80	2.50	1.86	26.83	28.67	15.95	3.10	10.91	4.33	10.26	1.41
LDT*	17	9.4	3.35	2.51	2.64	2.01	28.56	23.81	19.33	2.84	10.05	3.19	9.66	1.32

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-19
FY75 Emission Factor Program
Emission Results for Phoenix
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	49	92.4	27.57	13.29	25.30	1.49	426.26	228.45	380.54	1.61	11.11	5.00	9.83	1.74
1969	30	84.7	26.62	12.66	24.19	1.55	411.21	241.58	352.24	1.75	14.37	6.74	12.78	1.67
1970	35	75.5	29.49	36.07	22.82	1.80	389.91	337.43	307.77	1.95	13.35	6.05	11.50	1.90
1971	40	68.8	19.15	8.11	17.86	1.43	264.59	143.21	235.18	1.62	14.74	6.12	13.50	1.55
1972	45	56.1	17.77	9.34	16.03	1.56	253.51	116.93	228.94	1.59	14.43	5.19	13.48	1.47
1973	50	44.0	16.41	9.07	14.80	1.53	233.40	137.74	199.44	1.80	12.86	5.73	11.53	1.67
1974	50	34.8	18.47	18.87	15.22	1.69	258.60	166.61	228.17	1.60	13.07	6.36	11.72	1.60
1975	49	25.8	11.52	10.74	9.31	1.80	167.69	154.10	128.04	2.01	12.92	6.31	11.55	1.63
1976	151	12.8	7.46	4.36	6.63	1.61	97.22	57.30	81.42	1.86	11.53	4.68	10.70	1.47
LDT*	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-20

FY75 Emission Factor Program
Emission Results for Phoenix
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	49	92.4	24.22	12.92	21.72	1.57	372.21	219.62	313.17	1.84	7.54	3.97	6.51	1.78
1969	30	84.7	19.24	9.20	17.60	1.51	319.94	247.91	253.59	1.97	10.47	4.51	9.37	1.68
1970	35	75.5	19.07	9.57	17.11	1.60	306.95	262.97	216.39	2.58	9.69	4.21	8.66	1.70
1971	40	68.8	13.88	3.83	13.33	1.34	202.40	110.85	174.27	1.77	10.19	4.17	9.49	1.45
1972	45	56.1	12.42	7.99	11.30	1.56	180.50	104.63	148.91	1.94	9.64	3.53	9.02	1.46
1973	50	44.0	12.03	6.14	10.86	1.56	200.94	153.34	152.71	2.20	8.09	3.69	7.21	1.71
1974	50	34.8	16.03	19.20	11.66	2.04	234.86	191.28	171.91	2.36	8.06	4.44	7.04	1.70
1975	49	25.8	5.36	5.57	3.50	2.57	83.77	104.01	17.13	39.82	8.38	4.46	7.40	1.67
1976	151	12.8	3.79	4.48	2.37	2.67	50.54	73.46	12.94	7.90	7.77	3.80	7.05	1.54
LDT*	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-21
FY75 Emission Factor Program
Emission Results for Phoenix
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	49	92.4	18.30	7.94	16.94	1.47	256.10	159.51	215.72	1.83	11.87	5.56	10.50	1.70
1969	30	84.7	14.82	5.40	14.00	1.40	183.36	119.75	153.58	1.83	16.22	6.25	15.11	1.47
1970	35	75.5	15.94	11.70	13.92	1.60	187.22	176.94	140.54	2.20	14.82	5.83	13.32	1.71
1971	40	68.8	11.76	3.82	11.31	1.31	123.89	56.23	112.30	1.57	15.61	5.76	14.55	1.48
1972	45	56.1	10.85	4.51	10.24	1.39	117.14	58.23	104.11	1.65	15.02	4.76	14.26	1.40
1973	50	44.0	10.60	3.85	10.04	1.38	130.29	93.71	10 .28	1.84	13.15	5.80	11.77	1.70
1974	50	34.8	12.03	8.31	10.43	1.66	137.14	98.71	111.45	1.90	12.95	6.53	11.52	1.63
1975	49	25.8	4.69	2.75	3.97	1.81	57.04	53.77	35.29	2 93	11.90	5.64	10.77	1.57
1976	151	12.8	3.71	2.55	3.11	1.80	36.71	34.50	24.05	2.72	10.76	4.67	9.98	1.46
LDT*	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-22
FY75 Emission Factor Program
Emission Results for All Cities
Except Denver and Los Angeles
Cold Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	149	85.0	34.22	27.42	28.81	1.70	465.17	262.51	398.30	1.79	13.28	7.85	11.18	1.87
1969	90	77.1	27.49	20.92	23.63	1.64	360.05	206.51	310.25	1.73	17.10	7.94	15.21	1.67
1970	104	66.3	28.63	29.61	22.78	1.80	388.04	285.68	316.00	1.89	14.57	6.38	12.68	1.84
1971	120	63.7	23.34	26.01	18.91	1.70	285.87	174.44	248.38	1.69	16.55	6.63	15.12	1.57
1972	135	52.2	19.37	15.06	16.78	1.61	252.50	131.45	220.00	1.72	18.05	7.38	16.66	1.50
1973	204	43.2	17.75	14.22	15.37	1.60	232.37	142.35	199.66	1.74	13.48	5.75	12.21	1.60
1974	204	31.7	18.07	14.66	15.58	1.61	238.65	159.33	203.69	1.71	13.54	6.52	12.05	1.64
1975	203	22.4	10.09	7.72	8.55	1.70	154.47	156.22	118.86	1.99	11.98	5.60	10.79	1.60
1976	515	11.5	7.84	4.35	6.95	1.62	105.54	70.31	85.28	1.99	11.77	5.06	10.80	1.52
LDT*	64	13.4	9.45	6.82	7.62	1.94	140.62	114.69	103.79	2.33	11.59	4.75	10.75	1.47

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-23
FY75 Emission Factor Program
Emission Results for All Cities
Except Denver and Los Angeles
Cold Stabilized

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
		MEAN MILES	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	(K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	149	85.0	29.49	24.62	24.29	1.76	392.75	254.59	319.31	2.00	9.58	5.51	8.04	1.87
1969	90	77.1	21.50	19.98	17.97	1.67	277.91	194.67	220.05	2.10	12.71	5.65	11.35	1.66
1970	104	66.3	21.90	18.30	18.23	1.72	299.37	246.53	229.86	2.14	10.44	4.30	9.43	1.64
1971	120	63.7	17.96	19.16	14.66	1.71	223.70	154.30	180.68	1.99	11.44	4.75	10.40	1.60
1972	135	52.2	13.67	10.14	11.91	1.62	202.43	148.77	159.43	2.05	11.66	4.88	10.73	1.51
1973	204	43.2	13.10	12.26	11.03	1.70	199.60	142.52	151.14	2.25	8.61	3.80	7.79	1.60
1974	204	31.7	14.91	14.34	12.15	1.77	214.49	177.09	157.40	2.29	8.32	4.38	7.32	1.67
1975	203	22.4	5.78	6.71	3.60	2.75	102.03	158.37	25.03	27.16	7.86	4.13	6.99	1.63
1976	515	11.5	4.34	4.49	2.68	2.81	66.96	94.07	13.94	17.36	7.92	3.97	7.15	1.56
LDT*	64	13.4	5.46	7.01	3.04	2.94	95.62	144.34	19.32	30.61	7.19	2.89	6.66	1.48

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Appendix I-24

FY75 Emission Factor Program
Emission Results for All Cities
Except Denver and Los Angeles
Hot Transient

			HYDROCARBONS-GRAMS				CARBON MONOXIDE-GRAMS				OXIDES OF NITROGEN-GRAMS			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	149	85.0	22.66	19.45	19.18	1.65	258.21	168.81	211.59	1.93	14.74	7.66	12.73	1.78
1969	90	77.1	17.48	15.33	14.97	1.59	162.40	95.75	138.15	1.80	19.20	8.01	17.59	1.54
1970	104	66.3	16.05	11.28	14.08	1.58	168.61	132.11	136.56	1.91	16.72	6.34	15.21	1.63
1971	120	63.7	14.55	14.41	12.39	1.58	130.32	100.24	109.67	1.78	17.90	6.85	16.36	1.60
1972	135	52.2	11.64	5.37	10.84	1.43	120.26	77.74	101.81	1.79	19.00	7.25	17.68	1.47
1973	204	43.2	11.62	10.94	10.06	1.58	120.79	77.72	100.45	1.86	13.84	5.88	12.61	1.57
1974	204	31.7	12.43	9.66	10.79	1.61	130.32	100.74	103.82	1.95	13.37	6.52	11.88	1.64
1975	203	22.4	4.93	4.10	3.85	2.01	65.26	123.10	35.74	3.04	11.31	5.58	10.09	1.63
1976	515	11.5	4.07	2.71	3.33	1.91	43.63	45.82	25.86	3.08	10.92	4.83	10.09	1.48
LDT*	64	13.4	5.19	4.30	4.00	2.04	59.80	67.01	33.50	3.23	10.88	4.43	10.14	1.44

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976

Fy75 Emission Factor Program

Emission Results for All Cities Except Los Angeles and Denver by Model Year and Inertia Weight 1972 FTP

INERTIA WT. (LBS.)	66-8		1969		1970		1971		1972		1973		1974		1975		1976		LDT*	
	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
<2001	N= 1		N= 4		N= 5		N= 4		N= 3		N= 3		N= 0		N= 9		N= 16		N= 0	
HC	8.48	0.0	5.15	1.96	3.66	0.13	12.29	15.23	4.13	1.96	4.71	2.75	0.0	0.0	1.97	2.04	1.36	1.15	0.0	0.0
CO	130.72	0.0	63.55	27.57	46.93	16.52	80.83	33.35	54.67	33.06	51.41	15.96	0.0	0.0	24.19	23.64	22.16	25.03	0.0	0.0
NOX	2.15	0.0	2.29	1.02	2.67	0.63	1.22	0.54	2.37	0.33	2.57	0.67	0.0	0.0	1.88	0.60	1.86	0.50	0.0	0.0
FUEL ECONOMY	0.05	0.0	22.47	1.52	24.17	1.92	20.44	2.29	24.10	4.26	20.95	1.94	0.0	0.0	23.66	2.99	22.97	2.26	0.0	0.0
2001-2500	N= 3		N= 3		N= 6		N= 14		N= 21		N= 35		N= 22		N= 15		N= 51		N= 1	
HC	5.79	2.50	3.52	1.51	9.49	15.81	4.07	0.74	3.77	1.49	4.44	2.15	3.39	0.70	1.77	0.66	1.53	0.69	1.40	0.0
CO	71.72	23.84	47.30	26.90	52.94	47.35	56.28	20.33	45.10	20.02	57.87	38.66	37.63	10.96	17.92	7.69	19.08	8.78	19.65	0.0
NOX	1.92	0.74	6.31	3.47	3.91	1.53	3.11	1.72	3.47	1.46	2.25	1.03	2.85	0.83	2.39	0.85	2.73	0.83	4.67	0.0
FUEL ECONOMY	23.55	0.70	19.24	2.93	22.78	2.80	22.49	2.01	21.79	1.69	20.36	3.22	23.18	1.94	22.61	3.02	23.04	2.39	0.05	0.0
2501-3000	N= 23		N= 13		N= 14		N= 13		N= 17		N= 26		N= 38		N= 35		N= 73		N= 3	
HC	6.25	2.65	9.21	11.68	4.93	4.03	4.35	1.59	3.53	0.94	3.44	1.62	4.01	3.41	2.11	2.20	1.53	1.09	1.35	0.31
CO	86.77	39.79	63.50	32.65	55.40	31.21	76.85	42.98	55.37	27.64	50.25	29.68	53.05	30.35	28.16	20.80	21.32	18.82	15.30	3.46
NOx	2.92	1.59	3.43	1.04	3.50	1.25	4.47	1.70	3.53	1.73	3.27	1.23	2.50	0.99	2.48	1.20	2.19	0.81	2.21	1.16
FUEL ECONOMY	17.76	2.37	18.13	2.79	16.04	3.21	16.60	2.69	18.45	1.90	17.02	3.07	17.77	2.74	17.53	2.75	18.43	2.03	18.03	2.13
3001-3500	N= 37		N= 22		N= 22		N= 33		N= 25		N= 21		N= 28		N= 32		N= 99		N= 6	
HC	8.14	6.17	5.91	2.14	7.32	4.66	4.55	1.81	3.94	1.57	3.43	1.14	4.57	2.48	2.02	1.72	1.70	1.30	1.86	1.46
CO	103.03	75.91	76.43	37.88	112.82	84.81	54.96	25.24	48.00	26.31	52.65	24.82	54.96	25.97	31.51	27.08	18.54	16.49	31.13	14.39
NOX	3.26	1.89	4.31	1.64	2.77	1.37	3.60	1.28	3.97	1.53	2.28	0.76	3.19	2.01	2.79	1.42	2.88	1.24	2.30	0.71
FUEL ECONOMY	14.33	2.10	14.58	1.44	14.00	2.28	14.43	1.31	13.86	1.62	12.99	1.54	13.72	2.85	14.74	2.10	15.81	1.74	13.35	2.22
3501-4000	N= 52		N= 29		N= 36		N= 24		N= 19		N= 49		N= 44		N= 37		N=121		N= 43	
HC	8.63	6.40	6.77	4.15	7.48	6.07	5.51	5.64	4.47	1.51	4.53	4.88	4.74	5.05	1.81	1.04	1.88	1.21	1.80	1.62
CO	117.19	56.16	90.83	38.19	95.47	48.32	61.20	24.78	74.99	26.64	59.47	36.42	59.05	41.99	31.27	22.97	29.77	25.64	28.28	31.75
NOX	3.03	1.53	3.95	1.56	3.30	1.25	3.71	1.00	3.72	1.11	2.93	1.01	2.82	1.35	2.94	1.34	2.73	1.23	2.39	0.80
FUEL ECONOMY	13.17	1.70	13.42	1.42	13.09	1.34	13.03	1.43	12.62	0.92	12.10	1.42	12.28	1.07	13.42	1.32	14.17	1.31	12.62	1.48
4001-4500	N= 26		N= 15		N= 17		N= 25		N= 34		N= 41		N= 42		N= 47		N= 93		N= 11	
HC	10.56	10.38	6.25	2.73	6.18	2.26	7.75	8.82	5.78	4.51	4.54	4.56	4.63	2.81	2.20	1.53	1.57	1.00	3.03	2.00
CO	127.29	56.37	118.85	74.58	104.60	40.43	90.66	56.52	78.05	41.42	62.92	32.45	67.90	45.48	34.59	28.05	24.66	21.52	49.77	37.62
NOX	3.28	1.95	3.86	2.05	3.96	1.30	4.07	1.19	4.36	1.68	3.35	1.06	3.12	1.25	2.73	1.17	2.77	1.14	2.94	1.11
FUEL ECONOMY	11.56	1.23	11.89	1.27	11.74	0.95	11.02	1.39	11.43	0.99	11.49	1.10	11.22	1.03	11.69	1.17	12.63	0.85	13.03	1.33
4501-5000	N= 4		N= 4		N= 4		N= 5		N= 13		N= 26		N= 21		N= 13		N= 39		N= 0	
HC	9.64	4.02	4.18	2.30	5.30	3.28	3.50	1.84	4.35	3.40	3.57	1.50	3.94	1.70	1.71	0.86	1.26	0.74	0.0	0.0
CO	197.20	90.89	83.92	32.82	126.76	136.63	81.65	46.73	57.32	27.00	59.15	35.42	72.14	48.07	24.80	15.12	19.70	17.56	0.0	0.0
NOX	2.53	1.11	4.42	1.78	3.49	2.20	4.00	1.61	4.67	1.67	3.33	1.55	3.23	1.76	2.44	0.71	2.49	1.17	0.0	0.0
FUEL ECONOMY	10.30	1.30	11.15	1.24	9.77	1.13	10.49	0.98	10.80	1.10	9.74	1.24	9.98	1.26	11.02	1.16	11.41	0.77	0.0	0.0
>5000	N= 3		N= 0		N= 0		N= 2		N= 3		N= 3		N= 9		N= 15		N= 23		N= 0	
HC	10.95	5.46	0.0	0.0	0.0	0.0	2.31	0.03	2.24	1.04	2.48	0.49	6.23	5.76	3.63	2.60	1.53	0.96	0.0	0.0
CO	232.66	103.42	0.0	0.0	0.0	0.0	42.86	1.56	37.52	20.16	41.97	22.16	108.64	64.06	87.01	109.62	20.06	16.20	0.0	0.0
NOX	1.87	0.46	0.0	0.0	0.0	0.0	5.95	2.21	5.28	0.25	4.55	1.81	2.69	0.95	2.62	1.67	2.28	0.98	0.0	0.0
FUEL ECONOMY	9.15	1.36	0.0	0.0	0.0	0.0	9.25	0.98	10.59	1.88	9.59	0.75	9.73	0.48	10.14	2.15	10.70	0.70	0.0	0.0
TOTAL	N=149		N= 90		N=104		N=120		N=135		N=204		N=204		N=203		N=515		N= 64	
HC	8.49	6.73	6.53	5.39	6.74	5.83	5.51	5.71	4.41	2.64	4.11	3.41	4.40	3.45	2.12	1.71	1.62	1.10	1.99	1.67
CO	114.39	63.65	85.06	47.46	91.65	61.96	67.94	38.47	60.66	32.74	57.60	33.51	60.42	40.62	34.20	39.67	23.00	20.47	31.50	31.52
NOX	3.05	1.68	3.97	1.74	3.33	1.35	3.73	1.45	3.96	1.57	2.95	1.20	2.91	1.38	2.65	1.24	2.63	1.12	2.50	0.91
FUEL ECONOMY	13.59	2.82	14.19	2.76	13.83	3.06	13.81	3.38	13.80	3.50	13.07	3.43	13.18	3.52	13.86	3.60	14.68	3.34	13.00	1.81

Appendix I-26
FY75 Emission Factor Program
Emission Results for Chicago
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	77.9	8.27	6.11	7.05	1.69	103.37	51.14	89.21	1.85	3.21	1.42	2.90	1.62
1969	30	62.2	6.84	5.91	5.79	1.64	71.51	32.81	65.21	1.54	4.51	1.92	4.11	1.57
1970	35	57.9	6.54	5.19	5.48	1.73	81.18	43.99	71.10	1.70	3.37	1.42	3.03	1.64
1971	40	55.9	5.77	7.52	4.42	1.78	62.64	30.25	55.72	1.67	3.95	1.52	3.68	1.47
1972	45	42.1	4.26	2.49	3.79	1.58	57.00	31.94	48.23	1.84	3.97	1.39	3.76	1.39
1973	50	34.1	3.99	4.11	3.38	1.60	47.24	26.28	40.88	1.72	2.82	1.14	2.60	1.53
1974	50	24.0	4.19	4.40	3.45	1.68	45.30	25.81	39.28	1.73	2.86	1.18	2.60	1.57
1975	50	15.9	1.90	2.08	1.46	1.92	27.88	26.19	20.23	2.21	2.38	1.06	2.17	1.55
1976	150	7.3	1.52	1.05	1.26	1.84	23.61	22.79	15.75	2.57	2.49	0.91	2.34	1.43
LDT*	117	11.2	1.55	1.26	1.21	2.04	24.16	17.75	19.50	1.94	2.09	0.61	2.01	1.36

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-27
FY75 Emission Factor Program
Emission Results for Denver
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	73.4	6.86	2.53	6.44	1.44	96.58	40.99	87.24	1.63	2.65	0.95	2.49	1.46
1971	22	58.8	8.19	4.81	7.13	1.67	109.54	67.55	96.42	1.62	2.48	1.00	2.22	1.72
1972	25	46.1	6.07	4.21	5.37	1.56	80.19	21.19	77.55	1.30	2.69	0.85	2.56	1.38
1973	27	39.3	5.22	2.12	4.89	1.43	89.19	40.25	80.11	1.64	2.19	1.01	1.96	1.63
1974	27	28.2	5.00	1.59	4.76	1.38	85.95	26.37	81.96	1.38	2.14	1.14	1.91	1.60
1975	28	19.6	2.76	1.20	2.51	1.56	55.02	28.37	47.62	1.81	1.84	0.69	1.70	1.54
1976	34	10.9	2.72	1.28	2.45	1.58	52.28	27.56	44.97	1.82	1.84	0.74	1.70	1.50
LDT*	17	13.7	2.61	1.33	2.31	1.66	46.46	26.06	39.68	1.84	1.86	0.72	1.74	1.44

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-28
FY75 Emission Factor Program
Emission Results for Houston
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
		MEAN	ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	51.6	5.68	6.47	4.32	1.90	70.09	45.86	58.72	1.80	2.67	1.16	2.43	1.58
1974	27	35.6	4.56	2.10	4.17	1.53	71.79	42.87	61.96	1.71	2.61	1.32	2.32	1.67
1975	28	28.5	2.14	1.13	1.91	1.63	38.61	32.22	29.84	2.07	2.58	1.02	2.40	1.45
1976	34	11.5	2.06	1.53	1.69	1.84	25.60	20.39	17.36	2.70	2.84	1.17	2.63	1.48
LDT*	17	18.4	2.91	2.36	2.20	2.13	42.17	45.92	22.62	3.50	2.83	0.93	2.69	1.40

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-29
FY75 Emission Factor Program
Emission Results for Los Angeles
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	20	75.9	7.08	8.87	5.48	1.77	64.99	33.99	56.15	1.81	4.33	1.28	4.17	1.33
1971	22	68.9	9.72	14.27	5.69	2.44	87.85	70.22	64.46	2.39	3.62	1.39	3.31	1.61
1972	25	58.7	3.81	2.32	3.39	1.58	51.15	25.93	44.69	1.73	3.21	1.04	3.05	1.39
1973	27	47.5	4.83	5.99	3.82	1.72	56.29	27.56	50.60	1.61	3.26	1.78	2.86	1.68
1974	27	32.0	5.52	7.37	3.79	2.09	50.28	24.39	44.76	1.66	2.27	1.29	1.96	1.73
1975	28	16.2	0.96	0.48	0.84	1.70	13.42	11.25	10.03	2.15	2.02	1.12	1.81	1.57
1976	34	8.7	1.11	0.86	0.93	1.74	14.29	14.19	10.73	2.09	1.61	0.64	1.51	1.42
LDT*	17	14.1	1.40	1.06	1.11	1.98	23.61	30.28	13.76	2.72	1.98	1.08	1.74	1.67

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-30
FY75 Emission Factor Program
Emission Results For St. Louis
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	50	84.9	10.28	9.20	8.19	1.84	133.17	79.48	112.30	1.85	3.44	2.18	2.77	2.02
1969	30	84.3	6.64	6.72	5.41	1.75	86.19	46.49	74.37	1.76	4.10	1.69	3.75	1.56
1970	34	65.5	7.22	7.07	5.79	1.79	101.13	71.38	84.92	1.80	3.57	1.34	3.26	1.64
1971	40	66.3	6.35	6.23	5.02	1.84	78.92	49.92	68.79	1.67	3.92	1.44	3.56	1.67
1972	45	58.5	4.91	3.69	4.25	1.62	67.10	39.91	57.69	1.76	4.70	1.79	4.38	1.47
1973	50	45.3	4.00	1.46	3.74	1.46	60.74	25.56	54.86	1.63	3.31	1.30	3.08	1.49
1974	50	35.8	4.72	3.07	4.17	1.58	69.42	50.55	55.68	1.95	3.10	1.48	2.78	1.62
1975	48	23.9	2.28	1.68	1.90	1.78	41.28	64.62	25.85	2.46	2.72	1.30	2.44	1.62
1976	146	16.1	1.86	1.05	1.60	1.74	26.80	22.32	19.03	2.42	2.72	1.35	2.46	1.56
LDT*	13	15.0	2.34	1.41	1.99	1.42	43.21	31.73	32.92	2.22	2.55	1.07	2.39	1.44

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-31
FY75 Emission Factor Program
Emission Results for Washington
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
65-8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	27	46.6	3.59	1.89	3.23	1.58	57.86	37.67	47.40	1.94	3.05	1.09	2.85	1.47
1974	27	28.8	3.64	1.30	3.43	1.43	50.42	29.98	43.90	1.68	3.16	1.58	2.81	1.66
1975	28	19.2	1.96	1.53	1.58	1.88	30.13	23.79	23.03	2.13	2.73	1.36	2.47	1.57
1976	34	4.8	1.18	0.64	1.05	1.62	16.02	13.41	12.02	2.19	2.81	1.04	2.65	1.39
LDT*	17	9.4	1.25	0.77	1.04	1.87	19.22	16.86	13.29	2.77	2.55	0.91	2.42	1.40

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-32
FY75 Emission Factor Program
Emission Results for Phoenix
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	49	92.4	6.90	3.02	6.36	1.49	106.46	53.05	94.96	1.62	2.49	1.12	2.22	1.66
1969	30	84.7	6.11	2.51	5.66	1.48	97.49	57.65	84.88	1.68	3.31	1.43	3.01	1.57
1970	35	75.5	6.48	5.21	5.47	1.69	92.91	67.42	74.97	1.95	3.07	1.28	2.77	1.67
1971	40	68.8	4.40	1.42	4.21	1.34	62.27	30.39	56.05	1.59	3.32	1.33	3.08	1.48
1972	45	56.1	4.05	2.09	3.71	1.51	57.87	24.22	52.89	1.56	3.21	1.11	3.03	1.42
1973	50	44.0	3.79	1.80	3.47	1.50	57.91	35.13	49.29	1.80	2.79	1.21	2.52	1.65
1974	50	34.8	4.60	4.10	3.73	1.78	65.79	41.14	56.67	1.71	2.82	1.38	2.52	1.61
1975	49	25.8	2.25	1.72	1.82	1.49	33.53	28.58	24.05	2.29	2.84	1.37	2.56	1.59
1976	151	12.8	1.50	1.09	1.27	1.75	19.70	16.41	14.59	2.21	2.57	1.07	2.39	1.45
LDT*	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-33
FY75 Emission Factor Program
Emission Results for All Cities
Except Denver and Los Angeles
1972 FTP

			HYDROCARBONS GM/MI				CARBON MONOXIDE GM/MI				OXIDES OF NITROGEN GM/MI			
			ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC		ARITHMETIC		GEOMETRIC	
YEAR	N	MEAN MILES (K)	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
66-8	149	85.0	8.49	6.73	7.17	1.69	114.39	63.65	98.37	1.79	3.05	1.68	2.62	1.79
1969	90	77.1	6.53	5.32	5.62	1.62	85.06	47.46	74.39	1.67	3.97	1.74	3.59	1.59
1970	104	66.3	6.74	5.83	5.58	1.73	91.65	61.86	76.71	1.82	3.33	1.35	3.01	1.65
1971	120	63.7	5.51	5.71	4.54	1.67	67.94	38.47	59.89	1.65	3.73	1.45	3.43	1.55
1972	135	52.2	4.41	2.84	3.91	1.57	60.66	32.73	52.80	1.72	3.96	1.57	3.68	1.47
1973	204	43.2	4.11	3.41	3.58	1.59	57.60	33.51	49.21	1.77	2.95	1.20	2.70	1.56
1974	204	31.7	4.40	3.45	3.77	1.64	60.42	40.62	50.46	1.81	2.91	1.38	2.61	1.62
1975	203	22.4	2.12	1.71	1.72	1.84	34.20	39.67	24.01	2.26	2.65	1.24	2.40	1.57
1976	515	11.5	1.62	1.10	1.36	1.80	23.00	20.47	16.06	2.42	2.63	1.12	2.43	1.48
LDT*	64	13.4	1.99	1.67	1.51	2.09	31.50	31.52	20.38	2.71	2.50	0.91	2.36	1.41

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-34
FY75 Emission Factor Proram
Emission Results for Chicago

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	50	77.91	612.	458.	5.37	2.96
1969	30	62.25	432.	450.	3.95	2.50
1970	35	57.95	501.	453.	4.34	2.41
1971	40	55.88	453.	440.	4.68	2.81
1972	45	42.07	360.	391.	3.77	2.99
1973	50	34.07	336.	460.	2.79	3.00
1974	50	23.95	322.	376.	2.97	2.48
1975	50	15.86	149.	136.	1.32	1.78
1976	150	7.29	177.	195.	2.09	3.01
LDT*	17	11.24	84.	86.	0.92	1.79

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-35
FY75 Emission Factor Program
Emission Results for Denver

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	0	0.0	0.	0.	0.0	0.0
1969	0	0.0	0.	0.	0.0	0.0
1970	20	73.36	389.	306.	4.63	2.56
1971	22	58.76	360.	413.	4.02	2.79
1972	25	46.08	367.	415.	3.85	2.84
1973	27	39.27	255.	276.	4.13	3.03
1974	27	28.15	296.	326.	3.26	2.83
1975	28	19.60	196.	171.	2.43	2.56
1976	34	10.93	303.	355.	3.44	3.20
LDT*	17	13.71	255.	468.	1.94	2.29

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-36
FY75 Emission Factor Program
Emission Results for Houston

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	0	0.0	0.	0.	0.0	0.0
1969	0	0.0	0.	0.	0.0	0.0
1970	0	0.0	0.	0.	0.0	0.0
1971	0	0.0	0.	0.	0.0	0.0
1972	0	0.0	0.	0.	0.0	0.0
1973	27	51.57	287.	369.	4.11	2.93
1974	27	35.55	306.	309.	4.26	3.38
1975	28	28.55	177.	180.	2.63	2.29
1976	34	11.47	200.	209.	2.77	3.36
LDT*	17	18.42	160.	164.	2.22	3.05

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-37
FY75 Emission Factor Program
Emission Results for Los Angeles

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	0	0.0	0.	0.	0.0	0.0
1969	0	0.0	0.	0.	0.0	0.0
1970	20	75.87	286.	242.	3.57	2.64
1971	22	68.89	310.	323.	2.53	1.75
1972	25	58.73	224.	260.	2.54	2.07
1973	27	47.52	236.	302.	2.27	2.66
1974	27	32.02	170.	280.	1.55	1.43
1975	28	16.20	77.	76.	0.52	0.89
1976	34	8.67	69.	93.	0.88	1.73
LDT*	17	14.07	104.	179.	0.52	0.85

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-38
FY75 Emission Factor Program
Emission Results for Washington

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	0	0.0	0.	0.	0.0	0.0
1969	0	0.0	0.	0.	0.0	0.0
1970	0	0.0	0.	0.	0.0	0.0
1971	0	0.0	0.	0.	0.0	0.0
1972	0	0.0	0.	0.	0.0	0.0
1973	27	46.57	270.	383.	2.94	2.64
1974	27	28.76	217.	128.	2.77	2.95
1975	28	19.22	168.	186.	1.49	2.03
1976	34	4.80	77.	74.	0.75	1.93
LDT*	17	9.43	67.	70.	0.57	0.98

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-39
FY75 Emission Factor Program
Emission Results for Phoenix

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	49	92.36	511.	470.	5.12	3.07
1969	30	84.73	294.	126.	5.18	2.53
1970	35	75.52	320.	335.	4.39	3.14
1971	40	68.81	296.	179.	3.95	2.84
1972	45	56.08	256.	207.	3.42	2.35
1973	50	43.96	240.	232.	3.45	2.75
1974	50	34.85	234.	255.	3.54	3.05
1975	49	25.81	159.	263.	1.72	2.52
1976	151	12.79	120.	169.	1.31	2.35
LDT*	0	0.0	0.	0.	0.0	0.0

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

Appendix I-40
FY75 Emission Factor Program
Emission Results for All Cities
Except Los Angeles, Denver & St. Louis

IDLE HC AND IDLE CO TEST RESULTS

MODEL YEAR	N	MEAN MILES(K)	IDLE HC(PPM) MEAN	IDLE HC(PPM) SD	IDLE CO(%) MEAN	IDLE CO(%) SD
66-8	99	85.06	562.	464.	5.24	3.00
1969	60	73.49	363.	335.	4.57	2.57
1970	70	66.73	410.	406.	4.36	2.78
1971	80	62.35	374.	343.	4.32	2.83
1972	90	49.07	309.	315.	3.60	2.68
1973	154	42.54	285.	367.	3.26	2.86
1974	154	30.37	272.	295.	3.35	2.94
1975	155	21.90	161.	198.	1.71	2.20
1976	369	9.70	146.	181.	1.71	2.75
LDT*	51	13.03	104.	119.	1.24	2.20

* LDT INCLUDES LIGHT DUTY TRUCKS FROM 1975 AND 1976.

APPENDIX II

PERCENT RESPONSES TO QUESTIONNAIRE

1. Did you buy the vehicle new or used?

	FY 76
New	75.5
Used	24.5

2. How long ago did you purchase the vehicle?

0-3 months	4.8
3-12 months	27.1
1-2 years	22.9
Over 2 years	45.2

3. On a yearly basis, how many miles in this vehicle driven?

0-5000	4.3
5-10000	29.8
10-15000	41.8
15-20000	15.6
20-30000	7.6
Over 30000	.9

4. Where is the driving done?

	All	Most	Some	None
City Expressways	6.4	21.8	45.0	26.8
Major City Streets	7.8	33.5	46.3	12.5
Other City Streets	1.4	9.9	50.5	38.2
Rural Expressways	.6	3.6	17.5	78.3
Other Rural Roads	.2	.8	9.7	89.3

5. For what purpose?

	All	Most	Some	None
To and from work	11.8	36.1	21.1	30.9
Shopping	4.6	17.7	57.4	20.3
Business	3.3	4.8	10.6	81.3
Other	2.0	4.5	53.5	40.0

6. Would you consider that the vehicle has been maintained to the manufacturers specifications?

Yes	88.5
No	4.7
Don't know	6.8

7. How long ago was the last oil change?

Too new not due	4.6
Due but not yet done	2.8
0-6 mo	84.8
6-12 mo	4.3
Over 1 year	.3
Don't know	3.3

8. How long ago was the last engine tune-up?

Too new not due	20.2
Due but not done	4.7
0-6 mo	50.6
6-12 mo	15.9
Over 1 year	5.0
Don't know	3.7

9. Who performed this tune-up?

No tune-up	23.7
Dealer	20.1
Independent garage	25.4
Tune-up clinic	4.3
Yourself	22.3
Don't know	4.3

10. Has the vehicle or engine been altered by the installation of exhaust headers, modified exhaust system components, or performance carburetor components, camshaft, or ignition equipment?

Yes	.6
No	98.5
Don't know	.9

11. Has the vehicle been operated regularly on unpaved roads, in competitive events, or in hauling or transporting loads heavier than for which it was designed?

Yes	1.9
No	97.6
Don't know	.5

12. Has this vehicle ever had major damage in any of the following areas?

	Yes	No
Cooling System	2.4	97.6
Engine	1.4	98.6
Fuel System	.7	99.3
Exhaust System	1.7	98.3
No Damage	93.3	6.7
Don't know	1.4	98.6

13. If the vehicle requires unleaded fuel, has it been operated on leaded fuel?

Not required	61.1
Never	37.7
Seldom	.5
Occasionally	.1
Frequently	.3
Don't know	.3

14. Have you or others noticed a hydrogen sulfide (rotten eggs) odor in this vehicle's exhaust?

Never	84.4
Seldom	3.0
Occasionally	5.8
Frequently	5.3
Don't know	1.5